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# Factors Affecting Development of Public-Private-Partnership Highway Projects in Nigeria

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Highway infrastructure is an indicator of economic growth and development of any nation. Due to dwindling revenues and increasing expenditures of government, private sector participation was being sought to reduce the burden of infrastructure provision on government. This paper assesses factors impeding implementation of public-private-partnership highway project in Nigeria. To achieve the main objective of this paper, one hundred and ten (110) questionnaires were administered on major stakeholders in the highway sector; comprising public sector (highway engineers), quantity surveyors, concessionaires, contractors and bankers using stratified random sampling technique. Seventy-two (72) questionnaires were found useful for the analysis. The results indicate that excessive risks associated with public-private-partnership projects (4.40) is the most important factor impeding implementation of public-private-partnership highway projects by all the stakeholders. Other factors as rated by respondents have high mean scores which account for lack of visible success in the implementation of public-private-partnership highway projects in Nigeria. However, a Kruskal-Wallis test conducted showed that there is no statistically significant difference in the ranking scores among the stakeholders at 5% significance level, except for three out of the eighteen factors evaluated. The paper concluded that these impeding factors have affected the implementation of public-private-partnership highway projects in Nigeria. Hence, the need to work on these impeding factors in Nigeria is crucial and must be taken headlong to bring about desired economic growth and development.

**Keywords:** Build-operate-transfer, economic growth, development, highway, infrastructure.

## Introduction

Highway is a general term denoting a public way for purposes of vehicular travel, including the entire area within the right-of-way (Florida Department of Transportation, 2016). Highway construction projects are capital intensive. The burden of maintaining old ones and constructing new ones and over the years, has been too much for government in both developed and developing countries. Few authors posited that domestic savings by governments are not always sufficient in providing highway infrastructures in all countries, whether developed, transitional or developing economies (Baum & Tolbert, 1995; Awodele, 2012; Salawu, 2016). The reason is attributed to dwindling revenues and increasing expenditures. Nigeria, according to Infrastructure Bank (2014) needs around $200b (N30 trillion) to meet Vision 20:2020. To solve these problems in Nigeria, government at Federal and State level have resulted to involving the private sector to provide public services and utilities through adoption of different forms of PPPs. This according to Awodele (2012) is an acknowledgement of the benefits of PPP procurement system. These collaborations with private sector can boost infrastructure provision, thereby reducing the burden of debts on governments as well as local capital markets development (Ismail & Ajija, 2011).

PPP procurement is an arrangement where the skills and the expertise of private and public sectors are synthesized with varying levels of involvement and responsibilities culminating in provision of public services or infrastructure project (Babatunde *et al*, 2015). Gunnigan and Rajput (2010) posited that this procurement method has made provision of highway infrastructure easier because of the benefits therein. Over the last decade, PPP procurement for the provision of infrastructure has attracted interest and wider acceptance globally (Inderst, 2016). This is corroborated by Akintoye et al. (2003) that PPP projects enhance economic growth of a country, ensure development of infrastructure, quality service delivery and good governance through combined effort of both public and private parties (Levy, 1996). Despite wider acceptance and adoption of PPP procurement method all over the world, only a few numbers of countries have reaped the full benefits of the procurement system (Chan, 2011). Most countries are still performing below expectation due to number of impediments. Thus, identifying factors hindering the development of PPP highway projects is crucial for the improvement of future construction developments in the sector (Salawu, 2016). Identifying and proper evaluation of these factors will have a far-reaching effect in solving infrastructural deficiencies and enhance quality service delivery in Nigeria.

Therefore, it becomes imperative to identify and assess these factors in order to improve on the present situation in Nigeria. This will enable the governments and other participants in the sector, especially private investors to recognise significant factors impeding the development of PPP highway projects in Nigeria. The results of the study are expected to help them strategize on how to penetrate Nigeria and developing countries PPP market successfully. The results of the study are crucial as not many empirical studies have been conducted in Nigeria. Hence, conducting this research was formed in relation to recognizing the factors affecting development of PPP highway projects in developing countries like Nigeria.

## Literature Review

### Conditions of Highway Projects in Developing Countries

Highway infrastructural provision in developing countries are found to be insubstantial, majority of which are not accessible for all weather (United State International Trade Commission [USITC], 2009). Majority are unpaved and those paved are not properly maintained. This has been a major concern for government and all stakeholders in the sector. Table 1 summarizes the highway infrastructure conditions in selected African countries for the period between 2010 and 2013.

The road density as seen in Table 1 indicated African countries have the lowest total road density of 0.26km/km2 and an average paved density of 0.09km/km2. This is low compared to other parts of the globe. The neglect of the rail system and excessive pressure on the existing highways causes a lot of damages which make them deplorable.

In Table 1, only 38.90% of the total road length is paved in Nigeria. This cannot serve a population of over 180 million people. Salawu (2016) posited that one-third of existing highways in Sub-Sahara Africa is lost to overloaded and aging vehicles and trucks. The bad state of highways in Nigeria is responsible for high cost of transportation, and the multiplier effect of which reflects on the cost of goods and services (Kwak, *et al.,* 2009).

**Table 1**: Highway Infrastructure conditions in Major African Countries, 2010 -2013

| Countries | Total Road Length | Length of Paved Road | % of Paved Road | Land Surface Area ('000) | Total Road Density | Paved Road Density |
|---|---|---|---|---|---|---|
| Morocco | 58,395km | 41,116km | 71.00 | 444 | 0.132 | 0.092 |
| Kenya | 160,878km | 11, 189km | 07.00 | 569 | 0.283 | 0.019 |
| Nigeria | 200,200km | 75, 000km | 38.90 | 911 | 0.219 | 0.082 |
| Ghana | 109, 15km | 13, 787km | 12.59 | 228 | 0.480 | 0.059 |
| Egypt | 137,430km | 126, 742km | 92.00 | 996 | 0.138 | 0.127 |
| Cameroon | 51, 350km | 4, 108km | 08.00 | 473 | 0.110 | 0.01 |
| South Africa | 747, 14km | 158, 952km | 21.00 | 1, 213 | 0.616 | 0.13 |
| Algeria | 113, 55km | 87, 605km | 77.00 | 2, 737 | 0.042 | 0.032 |
| Average | | | | | 0.26 | 0.09 |

***Source:*** Central Intelligence Agency (2014)

## Factors Affecting Development of PPP Highway Projects

Despite the huge recognition of PPPs and their increasing usage in infrastructure development, the experience of both the public and private sector with this procurement route has not always been positive. Some PPP projects are either held up or terminated. This is corroborated by (Akintoye *et al.*, 2003) that PPPs have been widely applied in the global construction market, but a few factors affected its performance resulting in inefficiency and ineffectiveness of the projects. (Ogunlana, 1997) highlighted several problems impeding implementation of PPP projects. These include slow negotiations, inadequate project information, lack of relevant experience, lack of consistent risk assessment and management and less open communication as problems for achieving best value in PFI projects. However, (Chan *et al.*, 2006) found political instability, lack of adequate experience of PPPs as major impediments to failure of two PPP projects in Thailand.

Major problems associated with PPP highway projects have been researched on by many authors. Salawu (2016) posited that misallocation of risks could endanger development of PPP projects. Wrongful allocation of risks beyond the capacity of either party will lead to project failure. The need for both parties to have full knowledge of the risks to generate better outcomes and achieve project success is very important (Sun *et al.*, 2008;Xenidis & Angelides, 2005, Carrillo *et al.*, 2006). Private sector failure is another major problem to development of PPP projects (Hwang *et al.*, 2013). Lack of sufficiently competent private parties' technical and financial wise has impacted negatively on the development of PPP highways in Nigeria. The case of Lagos-Ibadan expressway is a good example whereby after three years of signing agreement, the project was yet to commence.

High cost of finance, transaction cost and lengthy lead time have also hindered development of PPP highway projects in Nigeria. Though, the fact that PPP projects arrangement is complex and involving many parties is not helping matter. These parties, however, have conflicting objectives and interest (Corbeth & Smith, 2006), which if not harmonized in an appropriate manner will jeopardize the achievement of project objectives. Since PPP highway projects require extensive expertise input (Li *et al.*, 2005), may incur high cost because the fees for lawyers, technical and other professionals, private sector finance and other advisory fees would be included in the cost of the projects (Askar & Gab-Allah,2002). Also, private sector incurs high bidding costs (El-Gohary *et al.*, 2006) due to consideration of client's and financier's objectives (Askar & Gab-Allah,2002; Sun *et al.*, 2008) and protracted procurement process (Carrillo *et al.*, 2006; Salawu, 2016). One other reason impeding sustainable BOT development is political/social obstacles due to inadequate advocacy to create greater acceptance by stakeholders. It could be in the form of

public opposition as result of funding the project (Grimsey & Lewis, 2007; Infrastructure Concession and Regulatory Commission [ICRC], 2013). Issues like town planning, environmental protection, heritage, fewer employment due to innovation of the private sector, high tariff, fear of job loss in the public sector also affects development of PPP highway projects (Askar & Gab-Allah,2002).

Furthermore, lack of a well-established legal framework is impeding BOT development in Nigeria. PPP regulatory framework is not definitive and that is why stakeholders use the loopholes therein as excuses for poor delivery of projects. More than ten (10) projects were terminated due to this single factor between 2005 and 2010 (Satpathy & Das, 2007). Nigeria do not have a well-established regulatory framework for BOT/PPP as the current legal framework only deals with the traditional command and control model. Also, the framework was adapted from other developed countries without recourse to our own peculiarity as a nation. Worthy to note is that without a well-established legal framework, there would be recurring disputes (ICRC, 2013; Gidado, 2010). Furthermore, inadequate instruments and capacity to meet the long-term equity and debt financing needs of infrastructure project is a major problem hindering the development of PPP highway projects in Nigeria. Conducive financial market is vital for project success, lack of which is abysmal failure (ICRC, 2013).

Lack of matured financial markets and difficulties in securing credit characterizes developing countries (Zhang & Chen, 2012; Ikpefan, 2015). In this part of the world, securing a financially strong partner is difficult because of unattractive financial market, due to high interest rate. Other factors include: global credit and financial crisis limiting foreign investment etc. (Amade, 2012; Cheung, 2009; Hwang *et al.*, 2013). Therefore, selected literature on factors affecting PPP highway projects development are presented in Table 2.

**Table 2**: Factors affecting PPP highway development

| Factors | References |
|---|---|
| Excess returns on investments | Grimsey & Lewis, 2007, |
| High cost of finance | Grimsey & Lewis, 2007, Kwak *et al.*, 2009, Hwang *et al.*, 2013 |
| Incomplete risk transfer | Grimsey & Lewis, 2007, |
| Higher costs to direct users | Grimsey & Lewis, 2007, Kwak *et al.*, 2009 |
| Very few schemes reached contract stage | Cheung, 2009; Awodele 2012 |
| Lengthy delays in negotiation | Amade, 2012; Cheung, 2009; Hwang *et al.*, 2013; Li *et al*., 2005 |
| Lengthy delays because of political debate | Cheung, 2009; Chan *et al*., 2006; Chan *et al*., 2010 |
| Participants' lack of appropriate knowledge and skills | Kwak et al., 2009, Hwang *et al.*, 2013 |
| Low competition due to high bidding cost | Kwak *et al.*, 2009 |
| Political/social obstacles due to inadequate advocacy | Amade, 2012; Kwak *et al*., 2009 Ahmed, 2011 |
| Lack of well-established legal and regulatory framework | Grimsey and Lewis,2004; Satpathy and Das, 2007 |
| Non-accountability due to little public information | Amade, 2012; Kwak *et al*., 2009 Gidado, 2010 |
| Excessive risks associated with PPPs | Amade, 2012; Hwang *et al.*, 2013 |
| Inadequate instrument and capacity to meet long-term equity and debt financing needs | Gidado, 2010; Zhang *et al.*, 2010 |
| High transaction cost and lengthy lead time | Hwang *et al*., 2013 |
| Confusion on government's objectives | Hwang *et al*., 2013 |
| High risk relying on private sector/private sector failure | Hwang *et al*., 2013 |
| Global credit and financial crisis limiting foreign investment | Ikpefan, 2015 |

Source: Authors (2017)

## Research Method

The purpose of this quantitative study is to show how stakeholders involved in PPP highway projects agreed on the rankings of the factors affecting the development of PPP highway implementation. The study adopts questionnaire survey method. Several authors used questionnaire survey (Ameyaw & Chan, 2015; Mohammed *et al.*, 2012;). This study began with an extensive review of related studies to establish a list of factors affecting development of PPP highway projects. The reported list was further reviewed in a pilot survey before finally administered on the respondents. The population for this study includes major stakeholders such as: public sector organizations (government agencies) especially those in charge of PPP projects, highway engineers, quantity surveyors, concessionaires, registered contractors and selected financial institutions who have participated in PPP projects in Lagos and Abuja. 150 stakeholders were identified through the data obtained from the regulatory agency in charge of PPP projects in Nigeria (Infrastructure Concession and Regulatory Commission). Using Krejcies Morgan Table, A sample of 110 participants was obtained. Out of 110 questionnaires administered to respondents, responses were received from 75 experts with varied interest and/or experience with PPP highway projects and the survey was administered between March and August 2017. 72 questionnaires were valid and used for the analysis while 3 questionnaires were not valid. A 5-point Likert scale on the level of agreement on the identified impediments was used in the study. 1- strongly disagree, 2- disagree, 3-somewhat agree, 4- agree, and 5-strongly agree. Data were collected personally by the researchers through a cross-sectional survey using stratified random sampling. This method of sampling is widely used and very useful when the target population is heterogeneous. In stratified random sampling, there is division of a population into smaller groups known as strata. Here, the strata are formed because of shared attributes or characteristics of the members. It is a form of random sampling where the proportion of the respondents plays significant role

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n selecting the sample. The population of the experts for the study was divided into the six (6) groups. Then, random samples were taken in proportion to the population from each group. The data collected was analysed using SPSS 22 version. Mean score (MS) was used for the descriptive statistics. Mean score has been widely used in construction management research to determine the significance of factors or variables i.e. risk ranking and allocation in PPP projects (Zikmund, 2003). MS is used to conduct evaluation from the survey results. Thus, the relative ranking of the variables /factors is determined from the survey results using the measurement scales. The factors were ranked accordingly while Kruskal-Wallis test was used for the inferential statistics. Kruskal-Wallis test is employed when there are three or more samples/groups. This is corroborated by (Ameyaw & Chan, 2016) that Kruskal-Wallis test is an appropriate statistical technique when a researcher wishes to compare three or more groups or population, and the data are ordinal. It is against this backdrop that Kruskal-Wallis test was undertaken in this study to determine whether there are significant differences of opinions among public sector authorities, concessionaires, local lenders/banks, consultants, academics and contractors on factors affecting development of PPP highway projects in Nigeria.

**Table 3** Distribution of Questionnaires to Respondents.

| Organization | Total Respondents | Lagos | Abuja | Questionnaire Collected | Response Rate |
|---|---|---|---|---|---|
| Client | 20 | 08 | 12 | 18 | 90 |
| Consultants | 40 | 06 | 010 | 16 | 40 |
| Concessionaires | 15 | 08 | 04 | 12 | 80 |
| Contractors | 20 | 06 | 08 | 14 | 70 |
| Bankers | 10 | 10 | - | 08 | 80 |
| Academics | 05 | 04 | - | 04 | 80 |
| **Total** | **110** | **38** | **34** | **72** | **65.5** |

## Results and Discussion

### Description of Respondents' Demographic Information

The demographic details of the respondents**.** 11% of the respondents are HND holders, 57% are BSc holders, 26% are MSc/MBA holders while 06% are PhD holders. 86% of the respondents are corporate members of their respective professional bodies. The respondents comprise of 25% working in client organization, 22% in consulting, 19% in contracting, 17% in concession company, 12% in banking and 6% in academics. 75% of the respondents have over six years' experience in BOT highway projects. Over 50% of the respondents have handled 3 projects and above. This shows that the information supplied by the respondents can be considered appropriate and adequate for the study

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**Table 4:** Overall Ratings and Ranking of Factors Affecting Development of PPP Highway Projects in Nigeria.

| Impeding Factors | MS | SD | Rank | Chi-Square Value | Kruskal-Wallis Asymp. Sig. p |
|---|---|---|---|---|---|
| Excessive risks associated with BOT | 4.40 | .725 | 1st | 1.405 | .924 |
| Inadequate instrument and capacity to meet long-term equity and debt financing needs | 4.26 | .628 | 2nd | 10.496 | .062 |
| High cost of finance | 4.15 | .548 | 3rd | 5.941 | .312 |
| Very few schemes reached contract stage | 4.15 | .664 | 3rd | 4.050 | .542 |
| Global credit and financial crisis limiting foreign investment | 4.10 | .609 | 5th | 6.844 | .232 |
| Incomplete risk transfer | 4.10 | .561 | 5th | 4.277 | .510 |
| High transaction costs and lengthy lead time | 3.96 | .488 | 7th | 2.641 | .755 |
| Lack of well-established legal and regulatory framework | 3.93 | .513 | 8th | 2.359 | .798 |
| Participants' lack of appropriate knowledge and skills | 3.65 | .653 | 9th | 3.676 | .597 |
| Private sector failure/ private sector failure | 3.54 | .627 | 10th | 2.732 | .741 |
| Lengthy delays due to complex negotiations | 3.42 | .599 | 11th | 12.870 | .025** |
| Lengthy delays because of political debate | 3.42 | .687 | 11th | 2.150 | .828 |
| Higher costs to direct users | 3.39 | .571 | 13th | 6.035 | .303 |
| Excess returns on investment | 3.18 | .613 | 14th | 6.701 | .244 |
| Non-accountability due to little public information | 3.18 | .484 | 14th | 18.933 | .002** |
| Low competition due to high bidding cost | 3.12 | .555 | 16th | 4.784 | .443 |
| Political/social obstacles due to inadequate advocacy | 2.99 | .544 | 17th | 7.906 | .162 |
| Confusion on government objectives | 2.72 | .537 | 18th | 11.568 | .041** |

**There is a statistically significant difference of opinion among the groups
Source: Authors (2017)

The results indicated that excessive risks associated with PPP projects (4.40) is the most important factor affecting the development of PPP highway projects by all the stakeholders, followed by inadequate instrument and capacity to meet long-term equity and debt financing needs (4.26) and high cost of finance (4.15). Others are few schemes reached contract stage (4.15) and Global credit and financial crisis limiting foreign investment (4.10) in Nigeria. This agrees with the studies of (Corbeth & Smith, 2006; Li *et al.*, 2005; Zhang & Chen, 2012; Askar & Gab-Allah, 2002). Developing countries like Nigeria have not fared well in PPP highway development because fund sourced locally are not always enough to meet the huge financial requirement needed to sustain it. Participants' lack of appropriate knowledge and incomplete or misallocation of risks have been other major impediments to development of PPP highway projects in Nigeria. This result agrees with (Sun *et al*, 2008), (Xenidis & Angelides, 2005), and (Carrillo *et al*, 2006). Wrongful allocation of risks beyond the capacity of either party will lead to project failure. The need for both parties to have full knowledge of the risks to generate better outcomes and achieve project success is very important. The ratings by the respondents (most mean scores greater than 3.50) show that most of the impeding factors have high mean scores, which accounts for poor implementation of PPP highway development in Nigeria. This indicated that all the identified factors are considered by respondents as important (serious) barriers to the development of PPP highway projects in Nigeria.
But these findings contrast with (Klynveld Peat Marwick Goerder [KPMG], 2010) which reported that lack of procurement efficiencies is a barrier to PPPs in Australia. Grimsey and Lewis (2007) identified public opposition as a barrier to PPPs.

The test of Kruskal-Wallis was conducted to determine whether there was a significant difference of opinions among the stakeholders (public sector authorities, concessionaires, local lenders/banks, consultants, and contractors) at 5% significance level. Under this test, the Chi-Square value and the significance level which is the Asymp. Sig. p was used to arrive at a conclusion pertaining to the opinions of respondents. The decision rule is that if the Sig. p value is less than 0.05, there is a statistically significant difference in opinions across the six groups. The results of Kruskal-Wallis test indicated that except for 3 (out of 18) impeding factors; there is no statistically significant difference in the perceptions of respondents on the factors affecting development of PPP highway projects (see Table 4). The 3 factors where there is statistically significant difference in the perceptions of respondents are: lengthy delays due to complex negotiations, non-accountability due to little public information and confusion on government objectives. The p-values for these 3 factors are less than 0.05 (see Table 4). This difference could be attributed to the fact that all the stakeholders with different ideology have divergent views as to the factors, they consider are critical to the implementation of PPP highway projects. For instance, while government is concerned with quick negotiations to have the project in place, other stakeholders are more concerned with proper negotiations to ensure that grey areas in the contract agreements are given utmost attention. This corroborated by (Gunnigan & Rajput, 2010) found that it took longer than necessary for the concession company to complete negotiation which resulted in delay at implementation phase of PPP highway projects. Another area of divergent view is the non-accountability due to poor public information. For instance, classifying certain documents as privilege information in conducting government business and accusations of corruption in Nigeria is not limited to the political class alone but cut across all governmental agencies. This portrays the entire country as a corrupt environment for PPPs, thus discouraging genuine local and foreign investors from participating in the Nigerian PPPs market. While the public sector will agree that there is no confusion in government objectives, other stakeholders do not. For example, the federal government has been working on Inland port

development with huge capital invested, the existing sea ports are due for expansion and need state of the art equipment to function properly to help in decongestion.

## Conclusion and Recommendations

The results indicated that most of the identified factors affect the development of PPP highway projects in Nigeria. The ratings by the respondents (most mean scores greater than 3) show that most of the factors affecting the development of highway projects have high mean scores which accounts for poor development of PPP highway projects in Nigeria. There is no statistically significant difference in the ranking scores among the stakeholders at 5% significance level. Hence, there is crucial need to work on these factors affecting the development of PPP highway infrastructure in Nigeria to bring about desirable economic growth and development.

Based on the conclusions drawn above, the following recommendations are made:

(1) Training on risk management should be organized for all the stakeholders in highway sector. This will reduce incidences of excessive risks and incomplete risk transfer in the sector.
(2) Government should diversify and open the economy to provide adequate instrument and capacity to meet long term equity financing and to attract foreign direct investment (FDI).
(3) The use of pension fund, insurance companies and establishment of infrastructure bank will reduce high cost of finance which is prevalent in the use of commercial banks loans.
(4) Government and all stakeholders should evolve a well-established legal and regulatory framework which will accommodate the peculiarity of Nigeria as opposed to foreign frameworks which are not yielding positive results in Nigeria.
(5) All the stakeholders should harness their resources to reduce high transaction cost and lengthy lead time.
(6)

The main contribution of this paper is in the identification of these factors and their significance to PPP highway implementation in Nigeria. A major limitation of the current study is that it focusses on only PPP highway projects in Nigeria. Therefore, it is difficult to establish how the current findings will generalise to other infrastructure sectors and countries.

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