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Risks Associated with Road Infrastructure Project Financing in Developing Countries: Study of Selected PPP Road Projects in Lagos, Nigeria

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Abstract:

Several World Bank reports on the infrastructure situation in the emerging economies such as Nigeria have indicated that adequate infrastructure provision is not only critical but inevitable for any meaningful economic development. This paper examines the risk factor which is a major impediment to infrastructure project financing. In Lagos, several PPP road infrastructure projects have suffered setbacks at various stages. The Public – Private Partnership (PPP) scheme is now becoming one of the prevailing ways for infrastructure development in Lagos and although infrastructure investment have gained increasing investors attention over the past decades, the empirical evidence on their risk implications is still limited. The research is limited to Lagos since PPP arrangement in project financing/investment is still very low in Nigeria. Random sampling technique was applied. Data collection was by structured questionnaires, personal observations, interviews and phone surveys. Data analysis was based on simple descriptive analysis which employed statistical tools. The result of the research identifies and categorizes the various risks into three main categories – financial, political and project performance risks. The result of this research further show the most common causes of project failures in Lagos PPP road infrastructure projects and also identifies the most critical investment risks in the sector. The paper further recommends the most responsive risk management framework and mitigation measures for Lagos PPP road infrastructure projects. Conclusively, and given the relatively high risk perception associated with road infrastructure investment in Lagos, it is of primary importance to carry out exhaustive risk identification, risk hedging/management reviews, and evaluation of risk mitigating instruments/measures before embarking on any road infrastructure project investment/finance.

Keywords: Project finance, critical risks, Public-Private Partnership (PPP), risk management, mitigating measures

1. Introduction

Several World bank Reports have highlighted the embarrassing road infrastructure deficits in Nigeria and some other developing countries and went further to emphasize that organizing sound financial framework to meet the ever – growing road infrastructure needs of the developing countries remains key challenge to policy maker (UN,2005). The poor infrastructure situation, with the overwhelming deficit, has been worsened by the effect of the economic and global financial crisis of the 2008-2009 which further reduced the potentials of countries to effectively invest in road infrastructure (UNCTAD, 2008). Consequently, the need for alternative solutions and models of investment in infrastructure such as Public-Private-Partnerships (PPPs) of different models have become imperative. This private investment in infrastructure project financing brings with it the attendant risks and challenges, especially in developing economies like Nigeria.

Admittedly, infrastructure investments have gained increasing investors attention over the past decade but empirical evidence on their risk characteristics is still limited. Understandably, the risk factor is a major impediment to infrastructure project financing and therefore the associated risks in infrastructure financing will have to be analyzed aimed at proffering advanced risk management framework and risk mitigating measures. There is also the need to formulate efficient mechanisms for sharing risk between the private and public sectors for a successful PPP arrangement with regard to investment in Road infrastructure project financing. It is therefore imperative for investors to identify, analyze, manage and mitigate the critical risks associated with investment in road infrastructure project. Working out measures for mitigating each of the risks and proffering standard framework for management of the risks remain key to successful investment in road infrastructure projects under a PPP arrangement.

In recognition of the paucity of the funds available to governments in the post global economic crisis (2008-2009), it has become modern strategy employed by government of developing countries of Brazil, Bolivia, Nigeria etc. to adopt modern strategies to encourage private initiative in road infrastructure provision and financing. This arrangement would enable their governments to reduce their public expenditure, generate more revenue and at least balance their budgets (Olukogu, 2010). Specifically, Nigeria, mindful of her acclaimed status as the most populous black nation on earth, set a

great vision to be among the top 20 economies in the world by 2020 and has gone ahead to establish the infrastructure Concession Regulatory Commission (ICRC) charged with catalyzing public and private resources for the development of world class infrastructure. Subsequently, the country has chosen Lagos, in view of her official record as the most populous and developed state in Nigeria, to set the pace with several road infrastructure projects under various PPP arrangements such as Lekki Concession Company/Lekki-Epe expressway road Project and Federal Government of Nigeria/Federal Ministry of Works and Bi-Courtney High Way Services Limited involving Lagos-Ibadan Expressway Project.

Experience from these selected road projects, coupled with several case studies, highlight the fact that challenges of improving road infrastructure needs require improved sources of funding, assessment of risks associated with PPP road infrastructure financing and investment, managing and allocating the risks, and improving risk coverage to attract investors and financiers. This has become necessary because Private/Public arrangements in road infrastructure projects have a history of subjecting investors to major risks and in some cases, to outright cancellation of the projects and legal disputes. As a matter of fact, the projected outcomes by various stakeholders at the onset of the project may not be realized eventually in road infrastructure project financing under PPP arrangement if the risk identification, risk management and mitigation are not properly handled..

Why are these projects so risky? What are the sources of risk? How can these risks be identified, analyzed, allocated, managed and/or mitigated. This is the subject matter of this paper.

1.1. Aim and Objectives of the Study

This study is aimed at determining the various risks associated with PPP road infrastructure project financing in Lagos, Nigeria. To achieve the stated aim, the following objectives have been outlined:

- To critically examine and analyze the challenges facing infrastructure investment in Lagos.
- To critically examine and analyze the risk exposure of infrastructure investors, in Lagos PPP road infrastructure projects.
- To review the risk hedging/managing and mitigating instruments/measures available to road infrastructure investors in Lagos.

2. Literature Review

2.1. Understanding Basic Principles of Project Finance for Infrastructure Project

Road infrastructure project finance is a little more complicated and difficult in emerging economies as a result of overwhelming unpredictable risks and unfavourable biased outcomes. The general understanding of several project finance arrangements in relation to PPP is that the projects can easily be separated from the sponsors and usually aimed at large-scale investments with its high cost and complexity and relying on key elements of cash flow estimation, risk analysis and allocation, risk management and mitigation (Biedleman, c; Fletcher, D; 1990). It is a preferred alternative to conventional methods of infrastructure financing and entails highly innovative and timely financing technique which has been used for several high-profile corporate projects. Project finance, as distinct from the conventional methods of finance, is a modern type of financing arrangement that can facilitate the execution of projects anywhere in the world, but particularly in developing countries experiencing serious challenges in securing financial resources (Brealey, R; Cooper, I; Habib, M; 1966). The basic understanding of project finance, which is used in projects with tangible assets and predictable cash flows in which the construction and operating targets can easily be established, is embedded in precise forecast of cash flows, allocation of risks among the various interested parties based on their relative advantage, separation of the business assets from the companies and sponsors by creation of a structured Special Purpose Vehicle (SPV) (Esty, 2004).

Infrastructure project financing refers to the financing of such basic physical, technical and organizational structures that supports a society or more succinctly, needed for the effective operation of a society and which is repaid from the cash flow of that project (Olukogu, 2010). Financing road infrastructure through PPP arrangement involves great risks to the financiers as a result of several factors inherent in the arrangement. Consequently, it is not surprising that financiers, and their investment advisers, make substantial efforts to ensure that the risks associated with the project are considerably reduced or eliminated. Of course, the inherent risks in road infrastructure project finance result in high project cost (World Bank, 2012).

2.2. Infrastructure Investment in Developing Economies

Infrastructure investments in developing economies have been on the increase in the post global financial crisis of 2008/2009. Countries have fashioned out several arrangements to improve infrastructure provision despite the consequences of the global economic crises through the establishment of various forms of PPP arrangements.

In Brazil, the Brazilian Development Bank (BNDES) is a typical example of how a development financial institution (DFI) could play a pivotal role in not only overcoming the effects of the global financial crisis of 2008/2009 in infrastructure investment but also using the response mechanism to the crisis to turn around the infrastructure situation in particular and the economy in general through its use of the tool of counter-cyclical lending. It is also interesting to Note that in Brazil, the BNDES has been involved in financing industrialization and infrastructure investment to such commendable extent that there has not been any major undertaking involving Brazillian capital that has come about without the support of the BNDES since the 1950's. The BNDES represents the largest supplier of long-term debt and equity financing for public and private enterprise, and is rated BBB+ by S & P. It issues bonds and lends to projects based on its selection criteria and financing modalities. Financing arrangement can be as long as 30 years at 6 percent per annum

with a 7 year moratorium. Records of IDFC (2012) annual reports indicate that BNDES which offers several financial support mechanism to companies of all sizes and enhancing investments in many sectors of the economy made total disbursement of about R\$ 139.7 billion in 2011 with infrastructure projects receiving the largest share of 40% (R\$ 56.1 billion) of the total amount disbursed.

The Indian Experience in PPP road infrastructure project financing is very interesting. In spite of the high growth rate over the past few decades, Indian continues to experience significant gaps in the supply of essential social and economic infrastructure. In the recent past, infrastructure provision in Indian was mainly financed by the Public sector through government budgetary allocations and internal resources of public sector infrastructure companies. However, private investment in infrastructure financing has grown to about 20 percent in Indian in the last 15 years through the concerted efforts of the private sector initiatives (IDFC 2012). The Government of Indian in the five year plan (2007-2012) projected infrastructure investment to over 9% of GDP and a rise of private sector investment to 30% and for the period (2012-2017), the Indian planning commission estimated that the targeted GDP growth of 9% would require gross capital formation of 38.7% of GDP and a rise in infrastructure investment from 8% of GDP in FY 12 to 10% in FY 17. The figure in the region of about US \$ 1 trillion representing annual investment of US \$200 billion would be required for infrastructure investment for the five-year period.

Like many other developing economies, Indian has embarked on a model of private sector participation in developing its infrastructure. As prevalent in growing economies especially in the post global financial crisis era (2008/2009), the Government of India has long recognizes that public savings are insufficient to fund Infrastructure development and lack the comprehensive implementation capacity. In view of this, the government has been promoting PPP models in all areas of infrastructure activities and putting institutional and regulatory frameworks in place. Consequently, the Infrastructure Development Finance Company of India (IDFC) was established. The company was established to provide long-term capital to help finance PPPs. The model represents such arrangement where the IDFC-fully owned by the government, borrows money guaranteed by the Government of India from multilateral organizations and lends same to infrastructure projects directly or through refinancing long term debt. The current Indian planning commission reports indicate that the IDFC has so far funded more than one-fifth of the national highways with private participation and more than half of the investment in other infrastructure activities with acknowledge quality and transparency of its corporate governance structure.

In Nigeria, the Infrastructure Concession Regulatory Commission-ICRC-Act 2005 was enacted to address the overwhelming infrastructure deficit and the embarrassing poor state of existing infrastructure in Nigeria (UDB,2008). The Act which established the ICRC empowers it to serve as a driver agency in facilitating the engagement of the private sector in initiating, developing and implementing PPP projects in acceptable transparent, competitive and sustainable manner. The commission is expected to put in place world-class infrastructure for Nigeria people and create enabling environment for the participation of the private sector in financing, operation and management of infrastructural facilities and services. The commission since its inauguration in 2008 has sought the support and assistance of Development partners (The World Bank and UK's Department for International Development(DFID) and DFID has been providing assistance through its Nigerian Infrastructure Advisory Facility (NIAF) Project towards the development and issuance of guidelines on PPP policies, processes and procedures as well as promotion of harmonized framework for the development of infrastructure and acceleration of market development for PPP projects (Foster, 2011).

Despite this giant stride to improve the state of infrastructure in Nigeria, the current state of physical infrastructure in the country remains a major development challenge and this situation is worsened by the huge gap in infrastructure finance (Sanusi 2010). The most onerous economic challenge facing Nigeria at the moment is how to fund the massive infrastructure needs of the nation and Sanusi further pointed out that transport infrastructural development has remained weak as a result of insufficient financing and emphasized that government will continue to evolve new approaches to close its infrastructure gap with potential sources of funding which include the private and public-private partnership arrangements. The PPP arrangement ensures several benefits and advantages ranging from improved service delivery, improved cost-effectiveness, increased investment in public infrastructure, reduced public sector risk, quicker/faster delivery of capital projects, access to secured long-term investment opportunities, improved efficiency based on managerial, technical, financial and innovation capabilities among others.

2.3. Risks in Infrastructure Project Financing

PPP Road infrastructure project financing is subject to several risks. Risk is part of every human endeavor and infrastructure project financing is no exception to risk involvement. Understandably, in infrastructural project finance, the loan can only be repaid when the project is operational. Notably, as a result of the risks involved, the cost of road infrastructure project finance is generally high and time consuming for such finance to be provided (Akindele, 2012). Therefore, if a major part of the project fails, the financiers are likely to lose substantial amount of money. The financiers and their advisers usually take extra steps and put substantial efforts to ensure that the risks associated with the project are considerably reduced or eliminated as far as possible.

In handling risks inherent in road infrastructure project financing under PPP arrangement, the first step involves risk identification. Project sponsors will usually prepare feasibility/viability studies and matters of particular focus will bother on the professional assessment of costs of the project and proper calculation of projected cash flow streams. Some risks are analyzed using financial models to determine the project's cash flow and the ability of the project to meet repayment schedules. Various scenarios are examined by adjusting economic variables such as inflation, interest rate,

exchange rates and prices for the input and output of the project (Esty, 2002). Esty further categorized project finance risks into construction phase-completion risk; operating risk; and market/off-take risk.

Having identified the infrastructure project finance risks, the next step will be risk allocation. Once the risk is identified and analyzed, they are allocated by the parties through negotiation of the contractual framework. Usually, for the purpose of risk allocation in infrastructure project finance under PPP arrangement, consideration is given to party who is the most appropriate and in the best position and financial capacity to bear it. In other words, risk is allocated to the party who is in the best position to manage, control and insure against it (Biedleman, 1990).

Another important step in risk discussions for PPP road infrastructure project financing is the issue of risk management. Risks must be managed in such manner as to minimize the possibility of the risk event occurring and to minimize its effect or consequence if it occurs. Risk management concerns allow project financiers to be involved in and monitor the project closely. Such risk management is enhanced by imposing reporting obligations on the borrower and exercising controls over project accounts although such extreme measures may lead to tension between the flexibility desired by the borrower and risk management mechanisms required by the financier (Esty, 2003). There are various risk response strategies open to investors and financiers in road transport infrastructure project financing. Risk Avoidance which entails changing the project plan to eliminate risk or adopting a familiar approach instead of an innovative one or avoiding an unfamiliar subcontractor, is one of the risk management strategies (Foster, 2008). Risk transference is also another strategy used as risk management tool and entails transferring or seeking to shift the consequence of a risk to a third party. It merely gives the risk liability to another party but does not eliminate it. This includes the use of insurance, performance bonds, warranties and guarantees (Nwachukwu, 2012). There is also the tool of mitigation which seeks to reduce probability and/or consequence of an adverse risk event to an acceptable level. This may entail taking early action to reduce the probability of a risk occurring or its impact in the project, and it is more effective than trying to repair the consequences after it has occurred. Risk Mitigation could take the form of implementing a new course of action that will reduce the problem or changing the conditions so that the probability of the risk occurring is reduced (Maliki, 2012). Another popular risk management strategy is Risk Acceptance which represents a technique whereby the project team has decided not to change the project plan to deal with a risk or the team is unable to identify any suitable response strategy. Acceptance could be active if a contingency plan is made and ready to be executed, should a risk occur or passive in which there is no action, leaving the project team to deal with the risks as they occur. Developing a contingency plan in advance, which may entail establishment of a contingency allowance or reserve, including the amounts of time, money, or resources to account for known risks, can greatly reduce the cost of an action should the risk occur (Marcelus, 2009).

2.4. Case Study I

2.4.1. Lekki Concession Company/Lekki-Epe Expressway Road Project.

Records by the Nigeria's National Population Commission (NPC) have always shown that Lagos remains the most populous state in Nigeria. As at 2006 population census records, the official population of Lagos was over 9 million even though unofficial estimates put the figure at about 15million which was supported by UN forecast of Lagos population growth of close to 20 million by 2010. The National Population Commission official record of over 15million as at 2014 is still controversial even as it falls short of UN projection of 25million by the same period. The ever increasing population, has brought to the fore, the dire need of essential infrastructure in basic areas such as roads/transportation.

In recognition of this, Lagos state established "The 2004 Lagos State Road Laws" which provided the framework for projects such as the Lekki Toll Road Concession and the "State Roads, Bridges and Highway Infrastructure (Public Sector Participation) Development Board" as the Regulatory Authority set up to oversee the Lekki Toll Road Concession and other such PPP infrastructure projects in the Lagos Roads sector. It is generally understood that the level of funding required to improve essential infrastructure in Lagos far exceeds the budgetary and resource capacity of the state and therefore required a range of key sources of funding such as the PPP arrangement in meeting the considerable infrastructure challenge.

Specifically, the Lekki Concession Company/Lekki –Epe Expressway Road Project involved three parties – Lekki Concession Company Limited (LCC), Lagos State Government (LASG) and the Office of the Public-Private Enterprise. The project is a 30-year concessionary arrangement which entails design, construct, finance and operate with a view to eliminate the embarrassing hitherto traffic gridlock along the expressway corridor. The concession which is for the period – November, 2008 – November 2038 has two phases: the expansion and upgrade of the 49.36km Eti-Osa/Lekki –Epe Expressway including the construction of the Falomo Bridge Ramp; and the construction of the 20km Coastal Road with an option to develop the southern By-pass. Financing for this user-based toll road, which involves the private party taking on full market risk, will be recouped through charging tolls, advertising fees, duct leases and other agreed revenue sources.

The financing structure consists of a \$450 million US dollars Public-Private-Partnership transaction real toll road with full market risk and estimated completion period of three (3) years. The Lagos State Government invested US \$42m; the African Development bank provided US \$85m; the Local Bank lenders (First bank of Nigeria Plc/United bank for Africa Plc/Zenith Bank Plc/Diamond bank Plc/Fidelity Bank Plc) provided US \$80m; and the balance was of US \$93m provided by Standard bank London underwritten by Standard Bank London and Stanbic IBTC Bank Plc.

Some of the issues and challenges of the project include the numerous arguments between the government, financiers/sponsors, concessionaire and the citizens which started as soon as the Lagos State Government ventured into the Public Private Partnership (PPP) arrangement with Lekki Concession Company (LCC) for the upgrading and expansion

of the Lekki/Eti-Osa express road. The state government view the PPP arrangement as imperative in improving the physical infrastructure in the face of lean and dwindling resources at its disposal while the people, especially the indigenes/residents/beneficiaries of the project, with strong support and backing of some human rights groups, see the arrangement as deliberate exploitation of the people and clear adjudication of government responsibility to the citizens. There is also the disagreement arising from the belief that some details of the concession were shrouded in secrecy. It was the general feeling that the public ought to know who the owners and promoters were and how the toll fees were determined as well as how the LCC emerged the preferred Concessionaire.

2.5. Case Study II

2.5.1. Lagos-Ibadan Expressway

2.5.1.1. Federal Government of Nigeria/Federal Ministry of Works and Bi-Courtney High way Services Ltd

The Lagos-Ibadan expressway, which links the commercial centre of Lagos with Ibadan and connecting the northern parts of the country with the south, has suffered lack of maintenance and repairs, and has been in very deplorable condition over the years resulting in very poor driving quality and gridlock with several damages in various sections of the expressway. The expressway which was built between 1974 and 1978 was opened to traffic in the later part of 1978 as a tolled road and spans from Oworonshoki area of Lagos State to Ojoo area of Ibadan town. In consideration of the funding constraints on the part of the Federal Government of Nigeria (FGN) and in recognition of the key and pivotal roles of the expressway in the economic and social development of the country, the FGN issued Invitation for Expression of interest in the design, Build, Operate and Transfer (DBOT) arrangement for the reconstruction, expansion, rehabilitation and modernization of the highway under a PPP scheme. Consequently, Bi-Courtney Highway Services Limited emerged the preferred Concessionaire in May, 2009 was granted concession by FGN under the PPP arrangement for 25years.

Under the concession agreement, there would be no financial cost to the federal government for the road covering about 106km, as the concessionaire was expected to raise the required fund through equity and long term loans while investment will be recouped through toll fees and advertisement for the 25 years period during which the concessionaire would be required to perform satisfactory maintenance of the road. The project comprised a modernized six-lane highway from Lagos to Shagamu and improved eight-lane from Shagamu to Ibadan; 14 new over-head bridges and selected by-passes; as well as hotels of international standards, relaxation parks, restaurant, stop-over motels, fuel stations and other facilities and resting points. Consequently, Bi-Courtney was to partner Rand Merchant bank of South Africa for funding and financial backing, and Group 5 – a South Africa Multi-disciplinary construction group known for its prowess in energy and road infrastructure, alongside some local contractors for the project. It was envisaged that the project when completed would bring a lot of prestige and public relation advantage to the country because people of different nationalities pass through the road which represents a major link from the commercial nerve centre of Lagos-Nigeria to other states of the federation. It would ensure better road transportation for people, products, goods and services as well as ensure journey time savings and improve road safety.

Projects of this nature and magnitude, under PPP arrangement, usually come with certain challenges and this is no exception. There was the initial delay in the approval of design; the initial lack of understanding exhibited by the Ogun state government and Bi-Courtney highway Services Limited –misunderstanding arising from the fact that some states which were affected by the project were not properly incorporated or carried along in the process by the FGN; Massive encroachment (satellite towns) on the highway; basis for the toll/advertisement fees/rates; and the initial misunderstanding between the concessionaire and the Lagos State Government on the revocation of Certificate of Occupancy of property owners on the right of way.

3. Methodology

In carrying out this study, both primary and secondary data were employed. Structured questionnaires were administered to road infrastructure investors and PPP stakeholders which include banks, government agencies, private investors and road infrastructure beneficiaries. 120 respondents were reached by random sampling and only 80 representing 66.66% of the respondents returned properly filled questionnaires. Data analysis was by simple descriptive statistics of frequency distribution, mean, standard deviation, graphical and percentage expressions and likert/scale relative significance index.

4. Result/Analysis and Discussion

The findings made in this study are presented and discussed subsequently below:

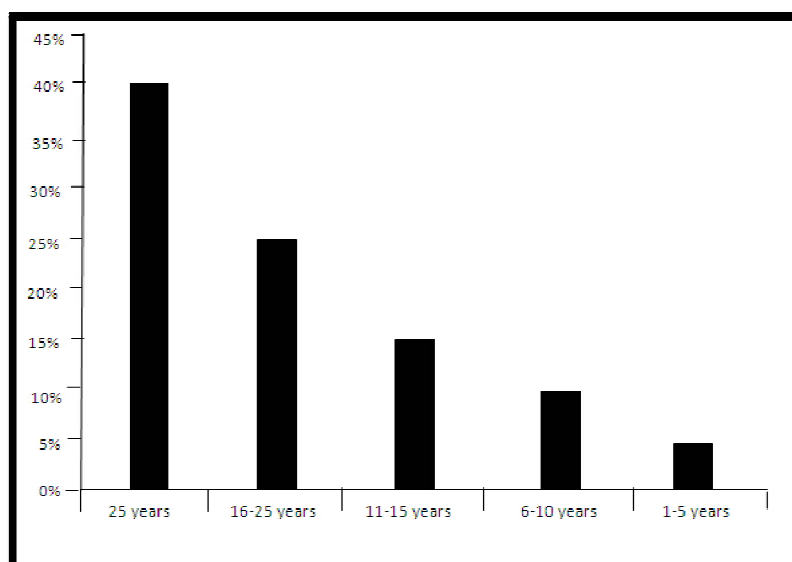


Figure 1: Representation of Respondents' Experience in Road Infrastructure Project Financing

Source: Field Survey and Analysis, 2017

The result of the analysis of the chart above shows that 40% of the respondents have experience of 25 years and above; 25 percent have experience of between 16-25 years; 20 percent have experience of between 11-15 years; while 10 percent have experience of between 6-10 years. 5 percent have experience between 1-5 years.

Critical causes	% of Respondents Who Answered						Mean Score	Ranking
	Not Applicable	Not at all Critical	Only Slightly Critical	Critical	Very Critical	Very Much Critical		
Capital cost Over run	0	3.2	6.0	36.0	28.1	26.7	3.78	1
Financial failure of contractor	0	0	32.5	43.1	5.2	19.1	3.72	2
Increased prices or shortages of raw materials	0	9.8	9.2	16.9	32.6	31.4	3.66	3
Government interference/inaction	6.8	34.2	18.8	22.3	14.1	3.8	3.58	4
Technical failure	0	11.2	38.5	27.3	13.4	9.5	3.52	5
Delay in completion/increase in interest expense	0	0	18.0	43.6	23.6	14.8	3.40	6
Overly optimistic appraisals of the value of pledge security	0	6.1	35.6	26.5	20.7	11.1	3.35	7
Poor management	0	0	19.3	42.8	24.7	13.2	3.28	8
Loss of competitive position in the market place	0	38.6	24.3	17.4	12.8	6.8	3.05	9
Technical obsolescence of the plant/equipment	0	16.2	36.7	27.4	8.3	11.4	2.80	10
Expropriation	0	11.6	12.3	18.0	32.8	25.3	2.50	11
Uninsured casualty losses	0	3.9	33.3	31.6	21.0	10.2	2.43	12
Financial insolvency of the host government	6.6	38.5	23.6	13.2	11.3	6.8	2.32	13

Table 1: Respondents' Expression of the Criticality of the Causes of Project Failures in Lagos Road Infrastructure Projects

Source: Field Survey and Analysis, 2017

The question was aimed at determining the most common cause of road infrastructure project failures to enable the research go further in the risk associated with road infrastructures projects in Lagos. The result of the survey from the respondents regarding the most common causes of such project failures are tabulated above. The common causes are ranked 1-13 on the basis of mean scores. The project failure cause with the highest mean score would be ranked 1 and the cause with the lowest mean score would be ranked 13. From the above table, Capital Cost Over-run, with the highest mean score of 3.78 was ranked as the leading cause of project failure followed by financial failure of contractor with mean score of 3.72 while financial insolvency of the host government was considered the least cause of project failure with mean score of 2.32.

Critical Challenge	% of respondents who answered						Mean Score	Ranking
	Not Applicable	Not at all Critical	Only Slightly Critical	Critical	Very Critical	Very Much Critical		
Mobility	0	4.6	4.6	33.3	28.8	28.8	3.74	1
Financial sector impediment	0	0	30.6	45.6	4.8	19.0	33.72	2
Lack of project development capacity	0	9.3	9.8	18.0	29.7	33.3	3.69	3
Lack of credit history	0	4.9	33.2	19.2	23.6	19.0	3.48	4
Cost recovery challenge	0	0	17.0	44.8	22.8	15.4	3.33	5
Lack of continuity in Governance	0	4.3	37.6	20.0	22.7	15.4	3.26	6
Financial resources challenge	0	5.8	27.4	43	9.8	14	3.18	7
Informal settlement and slums	0	33.6	21.1	21.3	13.5	10.5	3.06	8
Violence in the city	0	8.5	29.7	32.1	21.2	8.5	2.90	9
Electricity connection	0	14.2	37.6	26.6	16.6	4.8	2.81	10
Access to safe water and improved sanitation	0	10.5	8.5	16.0	30.6	34.3	2.73	11
Environment degradation and climate change	0	12.0	26.3	28.1	18.6	15.0	2.63	12
High transportation cost	0	31.8	23.1	19.3	15.6	10.1	2.51	13
Street trading	5.8	39.8	22.4	12.3	11.7	8.0	2.38	14
Physical infrastructure challenge	0	28.6	26.5	21.3	6.3	6.0	2.15	15

Table 2: Challenges of Road Infrastructure Development in Lagos

Source: Field Survey and Analysis, 2017

The survey results concerning the major challenges of infrastructure projects in Lagos are tabulated above. The challenges are ranked from 1-14 on the basis of mean scores. The challenge with the highest mean score was ranked 1 and the challenge with lowest means score was ranked 14. From the above analysis, financial sector impediments pose the greatest challenge to Road.

Critical Risk	% of Respondents Who Answered						Mean Score	Ranking
	Not Applicable	Not at all Critical	Only Slightly Critical	Critical	Very Critical	Very Much Critical		
Regulatory/Approval delay	0	4.8	4.8	33.3	28.6	28.6	3.71	1
Cost over-run	0	9.5	9.5	19.0	28.6	33.3	3.67	2
Land acquisition and compensation	0	0	19.0	42.9	23.8	14.3	3.33	3
Enforceability of contract	0	4.8	33.3	19.0	23.8	19.0	3.19	4
Legal/change in law	0	0	28.6	47.6	4.8	19.0	3.14	5
Operating	0	4.8	38.1	19.0	23.8	14.3	3.05	6
Market/Revenue/Tariff adjustment	0	4.8	28.5	42.9	9.5	14.3	3.00	7
Currency/financial exchange rate & convertibility	0	35.1	19.0	23.3	13.1	9.5	2.95	8
Political	0	9.5	28.6	33.3	19.0	9.5	2.90	9
Technical/technological	0	14.3	38.0	28.6	14.3	4.8	2.57	10
Force Majeure	4.8	38.1	38.1	9.5	9.5	0	1.86	11

Table 3: Risks Associated With Lagos PPP Road Infrastructure Projects.

Source: Field Survey and Analysis, 2017

The survey results concerning the criticality of risks associated with Lagos PPP road infrastructure projects are tabulated in Table 3. The risks are ranked from 1 to 11 on the basis of mean scores. The risk with the highest mean score was ranked 1 and the risk with the lowest mean score was ranked 11. Further analysis of the respondents' expression of the risk concerns in the PPP road infrastructure project financing indicates that Regulatory/Approval delays constitute the most critical risk with mean score of 3.71 and closely followed by Cost Over-run concerns while the risk Force majeure with mean score of 1.86 is of the least concern.

Risk Concern	Mitigating Measure	Effectiveness	
		Mean Score	Ranking
Legal/Change in Law	Obtain government's guarantees, e.g. adjust tariff or extend concession period	3.86	1
	Insurance for legal risk	1.67	3
	Maintain good relationship with federal and state government authorities		
Cost Over-run	Enter into contracts with the project participants, e.g. constructors, input suppliers, the operator etc Provide additional capital by shareholders in the form of stand-by capital contribution	3.86	1
	Ask the lenders to provide stand-by credit facilities for cost over-run	3.10	2
		2.95	3
Land Acquisition and Compensation Risk	Allow state government to handle the issue of land acquisition and compensation	3.08	3
	Obtain government guarantees to achieve timely acquisition of land Take up insurance cover to cover any issue that might arise	3.88	1
		2.95	2

Table 4: Effectiveness of Mitigating Measures

Source: Field Survey and Analysis, 2017

The survey also asked the respondents to rate the effectiveness of the available mitigating measures for the critical risks associated with Lagos PPP road infrastructure projects, which were developed from the literature review, personal experiences, questionnaires and informal discussions/interviews with road infrastructure project investment and financing stakeholders. The result as shown in Table 4 above indicates respondents preference to obtain guarantees from the government to either adjust the tariff or extend the concession period as the most effective mitigating measure for legal/Change in Law risk. The result also indicates that respondents felt that the most effective mitigating measure for Cost over - run risk was to include penalty clauses in contracts with the project participants, e.g. constructors, input suppliers, and the operator so that all share the responsibility, and the incentive, to perform well as individuals but also to engage in solving problem that affect the health of the overall project even if the cause of the problem does not lie with them. Again, the result of the table above shows that the most effective mitigating measure for Land Acquisition and Compensation risk is to allow the local communities to appoint their own representatives (attorneys/valuers) who will liaise with government representative/valuer to assess compensation.

Risk Management Strategies/Tools in Road Infrastructure Projects	Frequency	Percentage (%)
Avoidance	3	3.75
Transference	9	11.25
Mitigation	35	43.75
Acceptance	12	15
Organizational form	6	7.5
Contracting	6	7.5
Financial structuring	3	3.75
Diversification of supplier and client base	3	3.75
Corporate governance	3	3.75
Total	80	100

*Table 5: Risk Hedging/Management Measures/Tools Available to Road Infrastructure Investors/Financiers
Field Survey and Analysis, 2017*

The above table shows that investors/lenders prefer risk mitigation over other risk management strategies/tools. The result also shows that investors/lenders also accept risk as inevitable and make provision for its occurrence as a management strategy. 43.75% of the respondents, as indicated from the table above, prefer mitigating as the most acceptable risk response strategy/risk management strategy/tools.

5. Conclusion/Recommendation

Closing the enormous infrastructure gap in Lagos will help the most populous Nigerian state to reach the part of strong, sustained and progressive growth and development but this will rely heavily on innovative financing mechanism such as PPP arrangements. Presently, PPP road infrastructure, being a relatively new innovation, lacks the credibility and skill needed and do not have adequate investment, financial planning and co-ordination efficiency required for successful implementation. The critical risks, in order of importance, in Lagos PPP road infrastructure project financing have been established, given the relatively high risk perception associated with infrastructure investment in Lagos. Risk mitigating instruments required for effective private participation have also been provided and analyzed. The most effective measures for mitigating each of these risks have been exhaustively evaluated. The risk management framework discussed in this research will help the state and federal governments in examining their approach to PPP infrastructure projects because they are easy to apply and offers practical guide for local and foreign institutions that might want to invest in Lagos PPP road infrastructure projects in the future. In summary, therefore, this research has not only identified, examined and analyzed the various risks inherent in Lagos PPP road infrastructure project financing but also assessed the risk management and mitigation frameworks as well as established the most common causes of road infrastructure project failures and examined the challenges of infrastructure investments and innovation in Lagos.

This study finally comes up with the following recommendation:

- Risk identification and tested risk management framework with corresponding mitigation measures should be primary consideration in any proposed Lagos PPP road infrastructure project.
- It is also imperative that risks should be allocated to related parties in line with infrastructure investment risk principle that risk should be borne by the party most capable of controlling it.
- It is also highly recommended, that organized enlightenment campaign should be embarked upon to sensitize the masses who are usually the main beneficiaries of such projects to avoid the usual crisis arising from misunderstanding and misconceptions from both government, the concessionaire and the public.
- Modalities for fixing of toll fees and advertisement rates should be common knowledge and effort should be made to avoid unnecessary frequent increases in the tolls/rates by concessionaires to avoid an equally unnecessary reaction by the people which could work against the success of the PPP concept in the state and consequently increase the risk elements.

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