Framework for Managing Risk in Privately Financed Market Projects in Nigeria

By

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ABSTRACT

Shortage of funds and the need to improve the living standards of the people are among the reasons advanced for the recent embrace of Public Private Partnership (PPP) arrangements in developing markets in Nigeria. Construction work generally, and especially projects procured using PPP arrangement are more risk prone than those procured using other forms. This is mainly due to the lengthy concession period and the multi-parties involved in the arrangement. It is therefore, an imperative to properly manage the multi-faceted risks associated with PPP market projects (MPs) in a developing economy like Nigeria.

Review of the extant literature show that little has been done on risk management in PPP projects in Nigeria with no known effort on PPP MPs. This is due largely to the novelty of the PPP scheme in Nigeria. The main contribution of this research therefore, is better understanding of the risk management process in privately financed (PF) MPs in Nigeria. A holistic risk management framework is developed that identifies best practices in the risk management process with special emphasis on market projects. The structure specifies what should be done, who should do it and when it should be done throughout the whole life cycle of any PPP market project. Risks in (PF) MPs and their impacts were identified and assessed; allocation preferences of practitioners and mitigation measures to the risks were also assessed within the south-western part of the country

Data for the study was collected through a mixed methods approach viz: quantitative and qualitative approaches. Questionnaires were administered to practitioners in the industry within the south-western zone of the country to gain general idea on risks that are likely to occur and affect PF MPs within the region. In-depth interviews were also conducted with stakeholders on three PF MPs in the region. Descriptive and inferential statistics were employed to analyse data for the study.

The research identified inadequate knowledge of risk management concept in the Nigerian construction industry; especially in PPP projects, as being responsible for the poor performance of PPP projects using the Triple Bottom Line (TBL) - i.e. people, profit, and planet - as yardstick. It is believed that the framework will serve as a useful tool for rapidly learning about the risks involved in PPP market projects and for understanding viable options for their effective management.

DEDICATION

To

ELIZABETH OLADAYO
My helpmate, woman, mother and ever-supportive wife,

Our God-given children; the signs and wonders of this universe,

Mary, Michael, Rachael and Gabriel

To the loving memory of my parents

Senior Evangelist J.O Awodele
and
Lace Sup. Senior Elder Sister J.A. Awodele

and

For the use and benefit of mankind.

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DECLARATION STATEMENT

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In accordance with the appropriate regulations I hereby submit my thesis and I declare that:

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ACRONYMS AND ABBREVIATIONS

AIPDC	Abuja Infrastructure and Property Development Corporation
BC	Business Case
BPP	Bureau of Public Procurement
CCPPP	Canadian Council for Public Private Partnership
CIDB	Construction Industry Development Board
DD	Due Diligence
DEA	Department of Economic Affairs
DFID	Department for International Development
EOI	Expression of Interest
EU	European Union
FGN	Federal Government of Nigeria
FTB	Federal Tenders Board
GDP	Gross Domestic Product
ICRC	Infrastructure Concession and Regulatory Commission
ICSC	International Council of shopping Centres
IMF	International Monetary Fund
JV	Joint Venture
MDGs	Millennium Development Goals
MOF	Ministry of Finance
NBS	National Bureau of Statistics
NCPPP	National Council for Public Private Partnership
NEEDS	National Economic Empowerment Development Strategy
NGO	Non- Governmental Organization
NPC	National Planning Commission
OBC	Outline Business Case
OECD	Organisation for Economic Co-operation and Development
OGC	Office of Government Commerce
PCA	Principal Component Analysis
PFMs	Privately Financed Markets
PPP	Public Private Partnership
PS	Project Sponsor
PSC	Public Sector Comparator
RFQ	Request for Qualification
RFP	Request for Proposals
RMU	Risk Management Unit
RMP	Risk Management Process
SEEDS	State Economic Empowerment Development Strategy
SLEEPT	Social Legal Economic Environment Political and Technology
SPV	Special Purpose Vehicle
SWOT	Strength Weakness Opportunities and Treats
UN	United Nations
UNDP	United Nations Development Program
VfM	Value for Money
WB	World Bank
WEF	World Economic Forum

CHAPTER 1
GENERAL INTRODUCTION

1.1 Background of the study

Public infrastructure touches on a wide spectrum of basic amenities, which enhance the capacity of economic agents to conveniently engage in productive activities with reduced stress levels (Oluba, 2008). These amenities include water supply and distribution systems, electricity and communication systems, wastewater collection and treatment facilities, surface transportation facilities, mass-transit facilities, airports and airways, resource recovery facilities, waterways, levees and related flood-control facilities, docks or ports, school buildings, health facilities, shopping facilities and solid-waste disposal facilities etc. The importance of these infrastructures (whether social or economic infrastructure), in any national development cannot be over emphasised. Obozuwa (2010) opines that developed nations in the world enlivened their economies by accelerating their infrastructure and building on it. Oluba (2008) describes infrastructure as the driving force of economic activity because of the crucial role that it plays in providing the foundations upon which production and distribution rest. Haider *et al.,* (2004) contended that improved accessibility to employment, education, health, and other public services is important for the welfare of both the residents and the city itself. Thus, adequate infrastructure will enhance the quality of life for individuals as well as the vibrancy of the city as a whole, just as the absence or outright denial of basic environmental services constitute absolute poverty.

Currently, the world population is in the region of 6.8 billion, of which 81.7% reside in the less developed areas (UN-HABITAT, 2010). In 2007, the United Nations (UN) reported in the Economic and Social Affairs World Population prospect that the population in less developed regions of the world will have increased to represent 89.7% of the world's total population by 2050. These less-developed regions (or less developed countries, LDCs) have witnessed, and are still witnessing, much poverty and severe economic hardship. The problems facing the populace have been attributed principally to a lack of adequate infrastructural facilities. Based on the Organisation for Economic Co-operation and Development (OECD) and the World Bank (WB) estimate, the investment needed to establish the necessary infrastructure to fuel development globally could be approximately US$3 trillion per annum (or close to 5 percent of

current global GDP), of which approximately US$1 trillion per annum is required to be spent in developing countries (WEF, 2010).

The situation in these populous regions (i.e. developing countries) has been a cause for concern amongst international organisations and other developed nations who have felt that the pace of growth in less developed nations needs to increase to meet that elsewhere for sustainable development to occur across the globe. The International Monetary Fund (IMF), the WB, through the Department of International Development (DFID), UN Development Programmes and other NGOs have invested considerable funds in the provision of infrastructure in these regions and have also sought to assist financially and practically in combating diseases such as cholera and HIV/AIDS. Despite all the financial aid from these international organisations, developing nations themselves also need to show commitment to moving forward. As the Yoruba adage goes, *"Omo to ba sipa ni iya re gbe"* (meaning: it is only a child that shows signs that he/she needs help that the mother shows concern for). Therefore, in the quest to reduce poverty and grow emerging economies, the governments of LDCs have turned to Public Private Partnerships (PPPs) as alternative arrangements to procure much needed infrastructure. This is a reciprocal relationship, and is effective because it is widely known that the demand for infrastructural facilities is always on the increase due to the increasing population, and because countries cannot only finance such facilities from the national budget. Good examples of countries who have followed the path of developed nations like the United States of America, Canada, United Kingdom are China, India, Malaysia, Indonesia, South Africa, Singapore and Nigeria to mention but a few.

With an estimated population of 140 million (going by the 2006 census), Nigeria is the most populous black nation in Sub-Saharan Africa and the ninth most populous country in the world. It is estimated that the population of the country in 2010 was 158 million and this is likely to rise to 193 million by the year 2020 (UN DESA, 2009d). The state of Nigeria's infrastructural facilities with its daunting economic prospects and swift national development mean the country remains among the community of developing nations. It is evident throughout the country that the basic social and economic infrastructures are inadequate to cope with the demand placed upon them by its increasing population. As with other developing nations across the world; over the past three decades, governments in Nigeria at all levels; (i.e. Federal, State and local) have been responsible for the development of infrastructural facilities, especially market

facilities and shopping centres, to improve the social infrastructure. The conditions have changed recently; the government is now seeking alternative means of financing infrastructures across the economic and social spectrum through the use of PPPs.

Although private sector participation is increasingly invoked in the context of developing countries Nigeria inclusive, various problems have been encountered in this regard due to the short history and lack of PPP experience and expertise in many LDCs. Moreover; even in the developed nations, from whence the developing nations obtained the idea, there has been much criticism regarding the system's ability to deliver the promised benefits. Spackman (2002), and Broadbent and Laughlin (2003) asserted that in most developing countries the debate about PPP is still conducted in terms of "*public bad, private good*" on the basis of selective evidence. This lack of knowledge, as well as the lack of previous project experience in a similar setting has accounted for the failure of some of these projects. For example some highway projects in Washington and Arizona failed due to strong public opposition (Levy, 1996). Ogunlana, (1997) reported the failure of two Build, Operate, Transfer (BOT) transportation projects in Thailand and Abdul-Aziz, (2001) reported that the privatised National Sewage project in Malaysia failed due to the short history of PPP involvement in this area, and a lack of PPP experience and expertise.

Authors, including Merna and Smith (1994), Birnie (1999), Ng (2000), Li and Akintoye (2003) and Chinyio and Gameson (2009), who have reviewed PPP projects in developed nations present some good arguments highlighting their numerous benefits, although many have also presented the negative aspects of PPP. For instance, UNISON (2007), a labour organisation, has argued that PPPs is not the best approach for projects that are meant to deliver social benefits to citizens. In addition, Hardcastle and Boothroyd (2003) have presented an overview of the inherent risks associated with PPP projects. They observed that there is a vast range of risk issues that are apparent with PPP projects; some being upside risks and others downside risks. They concluded that there are many practical risk issues which are considered important by both parties involved in PPPs, but they suggest there is no adequate reflection of this in the processes in place to address risks.

The market is the main-stream economic structure that allows buyers and sellers to exchange goods, services and information. A market either emerges comparatively spontaneously or is constructed deliberately by human interaction in order to enable the exchange of rights (ownership) to services and goods. Mabogunje (1959) remarked that

"*Markets served as local exchange points or nodes, and trade was the vascular system unifying all of West Africa moving products to and from local markets, larger market centres, and still larger centres*". Hodder and Ukwu (1969) explain that markets are not merely economic institutions or phenomena, but are multi-functional institutions associated with several non-economic aspects of the Nigerian culture. Among some of the non-economic functions of markets is their use as centres for the dissemination of information relating to local and central government administrations.

Recognising the importance of markets, and other infrastructure as critical stimulants for economic growth and sustainable development, the Nigerian government has sought alternative means of financing projects through partnerships with private partners to minimise the demand on public funding and to ensure efficient management of the infrastructure after construction. Due to the complexity, duration and the multitude of stakeholders involved in PPP projects, the arrangement has been judged to be more risk prone than other procurement methods (Xenidis and Angelides, 2005). In Nigeria today, due to the short history and lack of PPP experience and expertise in the country, there have been instances of court cases regarding PPP projects, especially in relation to market development and disagreement between the financiers and the end user, i.e. the public (See This Day, 2005 and The Guardian 2011).

This research therefore provides a framework for managing inherent risk factors that affect the different parties involved in PPP market projects in Nigeria; as it has been established by Thomas, Kalidindi and Ganesh (2006) that the success of a Build Operate and Transfer BOT project is greatly influenced by the degree to which various project risks are identified, assessed and allocated. In other words, the success of PPP projects is contingent on the management of risk.

1.2 Problem statement

With the country's heavy dependence on the oil sector, coupled with the large reserves of both human and natural resources Nigeria as a developing nation has the potential to build a prosperous economy, reduce poverty significantly, and provide the health, education and infrastructure services its population needs. Despite this relative oil wealth, poverty is widespread (Wahab, 2006), with evidence of a growing catalogue of problems including the rising urban population, a declining real income, mass impoverishment, and growing public unrest, persistent armed robbery attacks at homes

and on the highways, a lack of basic infrastructures like good roads, portable water, good power supply, and good health facilities .This assertion is buttressed by numerous recent findings on the country's basic social indices which place the country among the twenty poorest countries in the world (NPC 2008). For instance, the human development index (HDI) of 0.511 for Nigeria, gives the country a ranking of 158th out of 182 countries (Human Development Report, 2009). This index (HDI) provides a composite measure of the three dimensions of human development: (a) living a long and healthy life (measured by life expectancy), (b) being educated (measured by adult literacy and gross enrolment in education) and (c) having a decent standard of living (measured by purchasing power parity income). Further evidence is afforded by the fact that 60 percent of Nigerians still live on less than US$1 per day (LOC, 2008). All these parameters can be seen as good indicators of the fact that the performance of the construction industry in Nigeria is in decline; since the infrastructure needed for these three aspects of human development: health, shelter and education are provided by the construction industry.

Akintoye *et al.* (2005) argued that public financing in developing countries has become so volatile due to the fact that projects for improvements rarely meet crucial infrastructure expenditure requirements in a timely and adequate manner; the situation in Nigeria is no exception, most building and infrastructure expenditures have been funded directly from the fiscal budget. Most of these facilities i.e. the public utilities are in short supply when compared to the country's ever rising population. The ones that are available are not performing to the standard required. These contribute to a highly disheartening experience in the country; specific examples include the, epileptic power supply from the Power Holding Corporation (PHCN) and the inefficiency in other public utilities like water, rail, roads and telecommunications. Also the attitude of the masses to public utilities is another serious problem affecting the performance of the Nigerian construction industry. People perceive public utilities as 'no man's property' thus public utilities are not cared for and often fall into disrepair.

Across the developing countries, the direct implications of poor economic growth and national development, occasioned by the failure of the construction industry to deliver much needed infrastructural facilities, are the humanitarian crises that are now evident throughout. In Nigeria for instance, the responses to this have been frequent cases of bombing and militant attacks on oil installations in the Niger Delta region, political and religious crises in various parts of the country, post election violence in the northern

part of the country by people of employable age (i.e. youths), to mention a few. There is a popular adage that says *"an idle hand is the devil's workshop*". In a report published by the House of Commons (2009) on urbanisation and poverty, it was stated categorically that "*without a new and comprehensive approach to urban development in Africa, a number of cities could face a humanitarian crisis in as little as five years' time, given the huge expansion of their urban populations"*. We are just two years from the date stated in the report, and the humanitarian crisis has spread throughout the continent and the Middle East (occurrence in Syria, Egypt, Libya, Yemen, Ivory Coast, Uganda, Nigeria etc. leaving much for the leaders of developing nations to consider).

To ameliorate these problems, the Nigerian government is seeking alternative methods of financing infrastructure provision, hence the involvement of the private sector in the provision of public services using different forms of PPPs. The shift to this system of project financing is in recognition of the benefit of BOT/collaborative schemes; as pointed out by Quartey (1996), such schemes can help the developing countries to increase private sector participation in infrastructure development, reduce the burden of debt on governments and ensure development of local capital markets. Presently, PPPs are being embraced to foster market development in Nigeria. For example, the Abuja Infrastructure and Property Development Corporation (AIPDC) has awarded various contracts worth over eight billion Naira for the development of district markets using the JV/BOT delivery system. Moreover, many markets within the south-western geopolitical zone of Nigeria are being reconstructed using PPP arrangements and many more are in the planning stages.

1.3 Research questions

In view of the broad scope of such development, this study has sought to answer a pertinent question:

"How can we manage the inherent risk factors associated with PPP projects in a developing nation, so that these much needed infrastructural facilities can be developed to promote economic growth and national development?"

Emphasis will be on BOT market projects in Nigeria**.**

Aside from this major question or problem; a number of further pertinent questions have emerged. These questions are important because of the novelty of the PPP concept in infrastructure development in the country, and are as follows:

- What are the risks factors affecting PPP projects in a developing economy?
- How are the identified risk factors allocated among the parties involved in PPP projects?
- What are the significant risk factors to each stakeholder in PPP market projects in a developing economy?
- What are the impacts of these critical risk factors on Stakeholder's satisfaction with the market projects?
- What are the policy recommendations for mitigating these potential risk factors?

1.4 Aim and objectives

In view of the foregoing, the aim of this study is to develop a framework for managing risks in privately financed market projects in Nigeria. The specific objectives of the study are to:

- develop a framework for identifying, categorising and representing the risks associated with PPP projects in Nigeria;
- identify and evaluate the critical risks to various stakeholders in PPP projects, with emphasis on market development in Nigeria,
- evaluate the impact of these risk factors on stakeholder satisfaction with the market projects,
- identify and evaluate the practical measures for mitigating these risks.
- formulate a risk management framework suitable for use by investors in PPP market development in Nigeria.

1.5 Research design and methodology employed

In order to meet the research objectives as stated in section 1.4, drawn from **Pragmatism philosophical worldview** the study employed a **mixed method research approach** which involves the combination of both qualitative and quantitative research design in a single study. The two research designs were combined concurrently in the study. This implies that both qualitative and quantitative data were collected and analysed in the study. The study begins with a careful review of extant literature on issues related to the Construction industry in Nigeria; its contribution to the national development, infrastructure development in Nigeria, market as an infrastructure, its development and the specific characteristics of markets in West Africa. Moreover,

literature on the importance of markets to national development as well as market financing and the need for alternative procurement route were also reviewed (see chapter 2). In the same vein, extant literatures were review on the concept of PPP and infrastructure development both at the global scene as well as in Nigeria (see chapter 3). Issue related to performance evaluation of PPP projects globally and in Nigeria specifics were review as presented in chapter 4 of this study. As a concluding chapter under literature review chapters, issues related to risk management in PPP projects generally were review and concluded with a need for the building of risk management culture in the procurement of construction projects (see chapter 5).

As earlier mentioned, data for the study were sourced using both quantitative and qualitative approaches. Questionnaires were administered to practitioners in the industry within the south-western zone of Nigeria. Semi-structured interviews were equally conducted with stakeholders on three privately financed market projects used as case study in the region. Data collected from the quantitative research approach i.e. questionnaire survey were analysed using both descriptive statistics and inferential statistics such as mean score and factor analysis respectively. Qualitative data were analysed using qualitative content analysis method and the Triple Bottom Line (TBL) concept. Systematic approaches employed in the conduct of these analyses are described in detail in chapter 6, 7 and 8 of the study. Findings from both the theoretical and empirical data from quantitative and qualitative strand of the study were then combined to develop a conceptual framework for managing risk in privately financed market. The framework was then validated using both physical examination and scoring approaches (see chapter 9).

1.6 Justification and significance of the study

Marketing in main-stream economics serve to allow buyers and sellers to exchange goods, services and information. The market facilitates trade and enables the distribution and allocation of resources within a society. Markets allow any tradable item to be evaluated and priced in order to facilitate the exchange of ownership. According to Mabogunje (1959) the institution of a marketplace evolved naturally with many of the pre-colonial rural markets of West Africa providing for the needs of local producers, consumers, and traders and also serving as focal points for long-distance traders. Historically, in Nigeria markets are always situated in the centre of the town, surrounded by major buildings such as the parish church, town hall and the King's

palace. Hodder and Ukwu (1969) explain that markets are not merely economic institutions, but are multi-functional institutions associated with several non-economic aspects of the Nigerian culture. Among some of the important non-economic functions of markets is their use as centre for the dissemination of information relating to local and central government administration. Disseminations of information about health matters, such as vaccination of people against chickenpox, smallpox and similar diseases and similar related concerns are spread through market. Also, political information and meetings between local chiefs and their subjects take place in the marketplace.

Until very recently, just as in medieval times, there were no permanent covered market buildings in Nigeria; the entire area typically consists of no buildings with shade provided by the wide-spread branches of trees. Blocks of stone, the size of small stools and smoothed poles from fallen market trees were used as seats. Where constructed seats are used, they are made of light wood and poles. Commodities for sale are laid on the ground (yam, cocoyam, cassava tubers) or in baskets (fruits in general) or in wooden or palm-woven trays (pepper, locust-beans, kolanuts, salt) or in calabashes (as in the case of beans, cassava flour and yam flour). At the end of the day's sales, both buyer and seller return home with their proceeds.

With the growth and prosperity in the towns, goods and services have increased as has the need for a place to keep goods safe between market days, This has led to the erection of lock-ups where individuals can keep their goods secured overnight. The construction of these lock-ups has become the responsibility of the local authority, to whom market tolls are paid in the expectation of additional reciprocal obligations, such as the maintenance of the market-grounds and the assurance of order and security at the market.

Recognising the importance of markets and other associated infrastructure as critical stimulants for economic growth and sustainable development, the Nigerian government sought alternative means to finance related infrastructure through partnership with private partners to minimise the demands on public funding and on efficient management of the infrastructure following construction. This is in line with the practice in developed countries like Europe and America, where there has been a major shift from public financed projects to privately financed projects.

Over the years, many researchers have tried to identify risks in construction works affecting developing countries and have also drawn lessons on risk management from

international construction projects in developing countries (Raftery, 1994; Raftery *et al.,* 1998; Ramcharran, 1998; Li *et al.*, 1999., Abdul-Aziz, 2001; etc). Silk and Black (2000) worked on identifying and managing risks in China, and Wang *et al.* (2000a, 2000b, 2004) identified and evaluated the unique and critical risks associated with BOT projects in China. Li *et al..,* (2005) worked on the allocation of risk in PPP/PFI construction projects in the UK. Thomas *et al*. (2006) similarly modelled and assessed critical risks in BOT road projects in India. Prior to this work (i.e. Thomas *et al..,* 2006), there were models of project risk assessment by other authors (see table 1). In most work on risks in PPP projects, simulation and sensitivity analysis are used for technical and financial risk assessment (Woodward, 1995; Malini, 1997; Lam and Tam 1998; Ye and Tiong, 2000).

The use of simulation, according to Wang (2004), is often constrained by the absence of reliable probability density functions for many input variables, and also the relevant inter-relationships. He further elaborated that non-availability of previous data based on similar projects often leads to inadequate modelling of important risk factors, when applying such methods. A review of extant literature shows that little research has been undertaken on risk management in BOT projects in Nigeria; those which have been judged noteworthy for the purposes of this research are: Yusuf (2005); Ayeni (2005) and Ibrahim *et al..*, (2006). These works focus on PPP infrastructure generally with no specific emphasis on particular projects, like market projects.

Table 1.1**:** Review of project risk assessment models

Model name/utility	Basic tool/theory	Author/researcher	Remarks
Cost impact assessment under varying risk allocation between owner and contractor.	Decision analysis.	Levitt *et al.*. (1980)	Incorporates differing risk perceptions, incentive to perform, value of controllable risks and differing preferences towards accepting risk.
Decision model for risky Investments.	Multi-attributable utility theory and Bayesian probability	Ibbs and Crandall (1982)	Complexity of the model increases with increase in number of attributes
Cost assessment framework for political risks in international construction.	Influence line Diagramming.	Ashley and Bonner (1987)	Model facilitates the identification of primary political risk sources and their impact on three project related cash flow elements: labour costs, material costs and overhead costs.
Identification, goal description, risk allocation, risk evaluation and risk mitigation.	Expert system – fuzzy set analysis.	Kangari and Boyer (1989)	Microcomputer based model which accepts subjective data input from experts.
Assessment of project risks during the bidding stage.	Analytical hierarchy process (AHP).	Mustafa and Al-Bahar (1991)	Incorporates both subjective and objective inputs.
Bid mark up for construction	Fuzzy set theory.	Peak *et al.*. (1993)	Risk associated consequences are

risk.			estimated as fuzzy numbers.
Loss assessment model.	Fuzzy sets and neural Networks.	Jablonowski (1994)	Neural networks using a fuzzy risk profile for various risk scenarios and associated expert limit selections.
Liability assessment model.	Decision analysis, Influence diagrams and their combination.	Jeljeli and Russell (1995)	Facility for incorporating subjective expert opinion. Demonstrated for liability assessment in environmental cleanup projects.
Cost risk analysis.	Influence diagramming and Monte Carlo simulation method	Diekmann *et al.*. (1996)	Modelled for internal and external risks. Influence diagramming for external risks and simulation for internal risks.
Evaluation of project life cycle Risks.	Fault tree and reliability graph analysis	Tsai *et al.*. (1999)	Objective data is required for each risk factor as input. Sensitivity regarding risk factors and effectiveness of risk management strategies can be evaluated.
Schedule risk assessment model.	Decision analysis in conjunction with a hypertext information system.	Mulholland and Christian (1999)	Incorporate knowledge and experience from experts, project specific information.
Liability assessment model for project disputes.	Monte Carlo simulation method.	Winter (1999)	Developed by Baker and McKenzie, London
Liability assessment model for project disputes.	Monte Carlo simulation method.	Winter (1999)	Developed by Baker and McKenzie, London
Project investment decision model for international projects.	Risk-based normative decision theory, cross impact analysis	Han and Diekmann (2001)	Effective for describing conditional relationship between variables subjectively. Scenario and sensitivity analysis can be carried out for various decision options.
Risk assessment for international projects (ICRAM-1).	Analytical hierarchy process (AHP)	Hastak and Shaked (2000)	Provide a structured approach for evaluating country level, market level and project level risk indicators of international projects.
Assessment of construction project risks	Risk break down structure, fuzzy logic.	Tah and Carr (2000)	Project risk exposure in terms of time, cost, quality and safety using linguistic inputs from experts.
Infrastructure risk analysis model (IRAM).	Event tree and expedience probability.	Ezell *et al.*. (2000)	Developed for water distribution Systems, but can be extended for other systems. Component vulnerability is subjectively assessed and scenario analysis was done through event tree approach.
Evaluation of investment decision in infrastructure project.	Monte Carlo simulation method.	Ye and Tiong (2000)	Decision criteria as NPV-at-risk (measure of minimum expected return at a given confidence level) by combining weighted average cost of capital and duel risk return methods. Difficulty in obtaining input probability density functions.

Source: Thomas *et al.*. (2006).

Lack of information in this direction in Nigeria, coupled with the fact that some risk

factors that are critical, for example in economic infrastructure projects, may not be critical in a social infrastructure; this then calls for a study on risk in privately financed market projects; for example a project which has a socio-economical and cultural undertone. Moreover, the current problem faced in some of the market projects, where BOT has been employed have been reported in 'This Day' a Nigerian daily newspaper in reference to the controversies that trail Ebute-Ero market in Lagos; where there is a court case occurring between the main job contractor and the Lagos State government. In addition, assurance of the future viability of PPP schemes in market development are in question; as asserted by the personal experiences of the researcher regarding a privately financed market project in the country, where after the completion of the facility the market was left un-occupied for months due to public opposition. Moreover, according to Ofori (2007), "*many new issues have emerged which require the attention of researchers on construction in developing countries. These include: (i) private sector involvement in the provision of infrastructure and other major construction projects; (ii) internalisation of construction in the advent of globalisation and liberalisation of economic regimes; (iii) formation of regional economic blocs and common markets, including among developing countries; (iv) global consensus on the need to fight poverty; (v) international concern with sustainable development, especially environmental issues; (vi) threats of pandemics such as HIV/AIDS and avian influenza; and (vii) cultural issues on sizeable projects*". All these and many other issues account for the interest in this area and the belief that the outcome of the study will provide a systematic risk management tool that will allow for early detection of risks and encourage stakeholders in PPP market projects in developing countries to identify, quantify, analyse, and respond to risk; as well as take measures to introduce risk mitigation policies, which will enhance the performance of such schemes and will invariably contribute to the efforts of other researchers in almost all spheres relating to research needs in developing countries, helping to lift billions of people who live in developing countries out of poverty, as identified by Ofori (2007).

1.7 Scope and limitations of the Study

In Nigeria today PPP projects exist in one form or another across the six geo-political zones of the country. A review of extant literature has revealed that different forms of PPP are being employed across the regions of the country to develop projects ranging from roads; tourism; hostel development in Universities; housing estates; mega malls to

power generation. This study focuses on BOT/JV market Projects which are already at the operational stage within Nigeria. The experience of the researcher of a particular case of a market construction, where PPP was employed, informed the choice of markets; in addition, the case of a dispute affecting a similar project in the former capital city of the country (Lagos) also aroused the interest of the researcher in this direction. Moreover, many more markets are been conceived and some are already at the point of implementation across many states throughout the country.

Due to cultural differences across the geopolitical zones of the country, (the country has about two hundred and fifty local languages with three predominant languages viz; Yoruba, Ibo and Hausa) and in view of the need for homogeneity of data, data was collected pertaining to market projects within the southwest zone of the country where the predominantly Yoruba speaking tribe reside (precisely Lagos and Akure). The choice of these regions was informed by the fact that: (i) the researcher hails from this region, (ii) the researcher was also involved in one of the case studies as a resident Quantity Surveyor representing the sponsor within the region and (iii) many of the privately financed market projects which have reached the operational level are within the region. A total of three cases (3) were selected from the study area namely, (a) Reconstruction of Erekesan Market in Akure, (b) Ikeja Cantonment Ultra Modern Market Complex in Lagos, and (c) Oluwole Urban Market Phase 1, Oluwole, Lagos Island. The dearth of cases for the study was due to the fact that PPP schemes are new in the country and completed projects are few.

1.8 Outline of the study

Figure 1.1 shows a schematic plan of how the study has been conducted and reported. The activities in the study were divided into two main phases viz: Pre-field work, and Post-field work. The pre-fieldwork activities are reported in the six main chapters of the study. The first chapter - general introduction to the study (this section of the work), involves discussions on the general background to the study, it encapsulates the aims and objectives of the study and the rationale and significance of the study were also discussed. The general introductory chapter ends with a description of the scope and limitations of the study. Chapters 2-5 consist of reports on previous studies on concepts such as: (i) the Construction Industry globally and narrow down to Nigeria in specific; (ii) the concept of Public Private Partnership (PPPs); (iii) evaluation of performance of PPP projects globally; and (iv) risk management in PPP projects. The pre-field phase of

the study ends with a report on the procedures that were followed in the course of conducting the research.

Next after the pre-field work phase is the fieldwork which involves the actual data collection following the procedures described in the previous phase. The final phase is the post field activities which involve the presentation of the data collected; allowing for analysis of that data using appropriate analytical tools, and relating the findings from the study to those from previous studies. All these are reported in chapter 7 and 8 of the thesis. Chapter 9 then presents the proposed framework for managing risk in PPP projects and the results of the framework validation and evaluation. Systematic report of how the objectives of the study have been achieved and the highlights of key findings from the study are presented in chapter 10. The contribution of the study to both the academic and business world at large are captured in the same chapter. The chapter finally concludes with a personal reflection on the entire study.

Figure 1.1 provides an outline of the study in terms of each chapter:

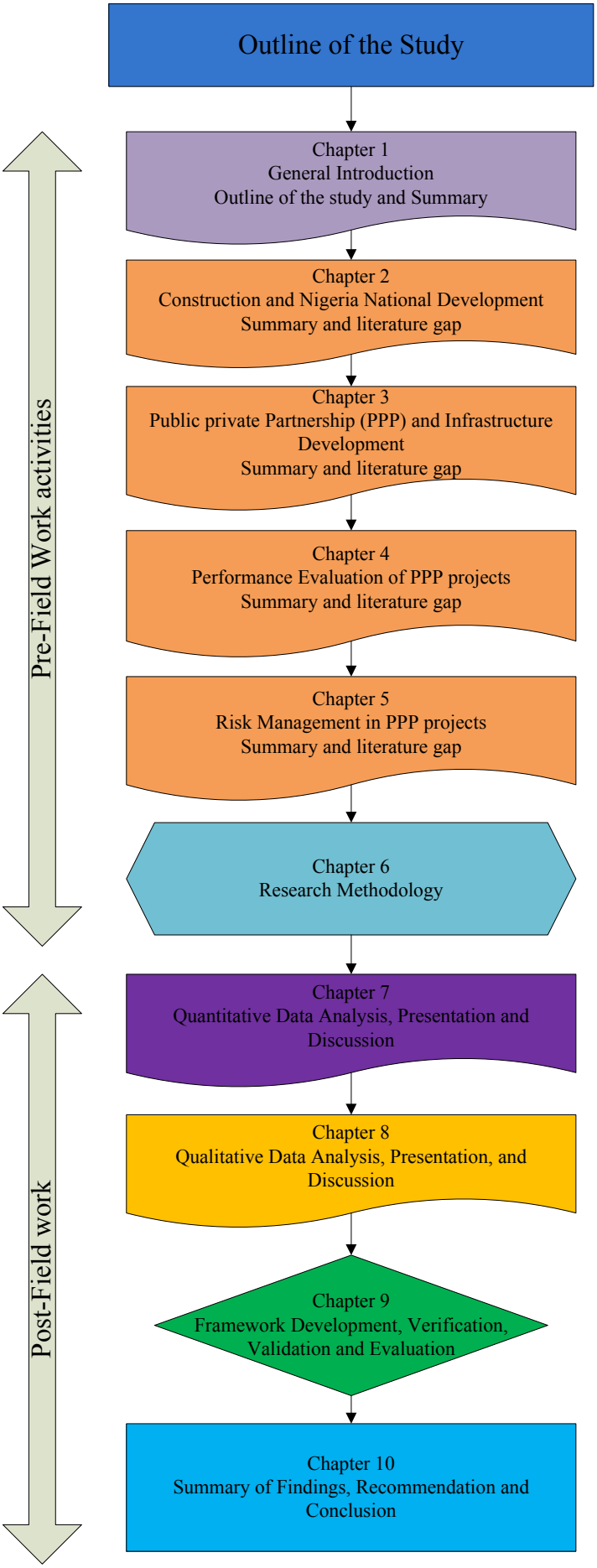

Figure 1.1: Outline of the study

1.9 Summary of findings and Conclusions

The following are some of the findings that emerged from the study:

- Market remains a vital component of retail structure in Nigeria and contributes significantly to the national development due to its socio-economic functions it performs. However, lack of good infrastructure has been a bane to its effective performance.
- There has been a recent embrace of PPP in developing this infrastructure in Nigeria but due to lack of understanding of PPP arrangement and risk management concepts among construction practitioners in the country the results has not been encouraging.
- Using principal component analysis the study revealed 16 principal risk factor and 68 associated risk variables that affects the performance of privately financed market projects in the south-western part of Nigeria.
- 33 out of these 68 risk variables were allocated to the private sector, while public sector are to handle just only 9 and the rest 26 were to be shared between the private and public sectors.
- The study also revealed that stakeholders are not satisfied due to poor performance of these markets as a result of these risk events that adversely affect the markets.
- 28 practical mitigation measured were then identified to mitigate against the occurrence of these risk event.
- An holistic risk management framework that identifies best practice in risk management with emphasis on solicited PPP market was developed. The framework specifies what should be done, who should it, how it should be done and when it should be done throughout the life cycle of PPP project. The study then concluded that if all the recommendation in the study are considered and implemented on privately financed market projects, the continue poor performance can be avoided and the expected benefits of private participation in infrastructure development in Nigeria will accrue to the people.

CHAPTER 2
LITERATURE REVIEW

"A successful society is characterized by a rising living standard for its population, increasing investment in factories and basic infrastructure, and the generation of additional surplus, which is invested in generating new discoveries" Robert Trout

2.1 Introduction

This research touches on concepts such as the performance of the construction industry, markets as infrastructure, PPPs, and Risk management. Therefore, for an enhanced understanding, and in order to identify gaps in the body of literature in these areas, extant literature were reviewed and this is then presented in the four main chapters of the thesis. Chapter two forms the first literature review chapter and focuses on the efforts of other researchers in relation to the construction industry in Nigeria and that in other developed and developing countries. In addition, the importance of infrastructure facilities, the way they are financed and their development in the context of developing nations with special emphasis on market were also reported in the chapter. This chapter also investigates the need for alternative means of procuring much needed infrastructure facilities, and concludes with a brief summary identifying the gap in the literature (the other aspects of relevance, determined by reviewing available literature, are presented in chapters 3, 4 and 5 of the thesis).

2.2 The construction industry in Nigeria

2.2.1 Nigeria

Nigeria is a developing country located in West Africa on the Gulf of Guinea between Benin and Cameroon**.** Nigeria shares borders with Cameroon (1,690 kilometres) to the east, Chad (87 kilometres) to the northeast, Niger (1,497 kilometres) to the north, and Benin (773 kilometres) to the west (see figure 2.1). Nigeria covers an area of 923,768 square kilometres, including about 13,000 square kilometres of water. The country became an independent country after achieving independence from the United Kingdom on October 1, 1960. Although Nigeria is slightly below average in terms of its level of urbanisation (about 45 percent), the country has one of the world's highest urbanisation growth rates: an estimated rate of 5.3 percent per year, with an estimated net migration rate in 2008 of 0.25 migrants per 1,000 people (LOC 2008).

In 2007 according to the LOC report (2008), Nigeria had an estimated gross domestic product (GDP) of US$166.8 billion using the official exchange rate, and US$292.7 billion based on purchasing power parity. This makes Nigeria the second largest economy in Africa, recording an annual growth rate of 6.4 percent in real terms. GDP per capita was about US$1,200 using the official exchange rate and US$2,000 using the purchasing power parity method (LOC, 2008). Nigeria's economy depends mainly on oil and gas revenues, which account for about 60% of Nigeria's GDP and over 90% of its foreign exchange earnings. Nigeria has proven oil reserves of 36.2 million barrels and natural gas reserves estimated at 182 trillion cubic feet, making the country the 10th largest oil producer in the world with the seventh largest reserves, the largest in Africa (LOC, 2008). Administratively, the country is divided into six geopolitical zones: South–West Zone; South–South Zone; South–East Zone; North–West Zone; North–Central Zone; and North–East Zone and these are comprised of a total 36 States. The country has 774 Local Government councils with about 250 Ethnic groups (See figure 2.2 for administrative map of Nigeria showing the 36 states and federal capital territory Abuja).

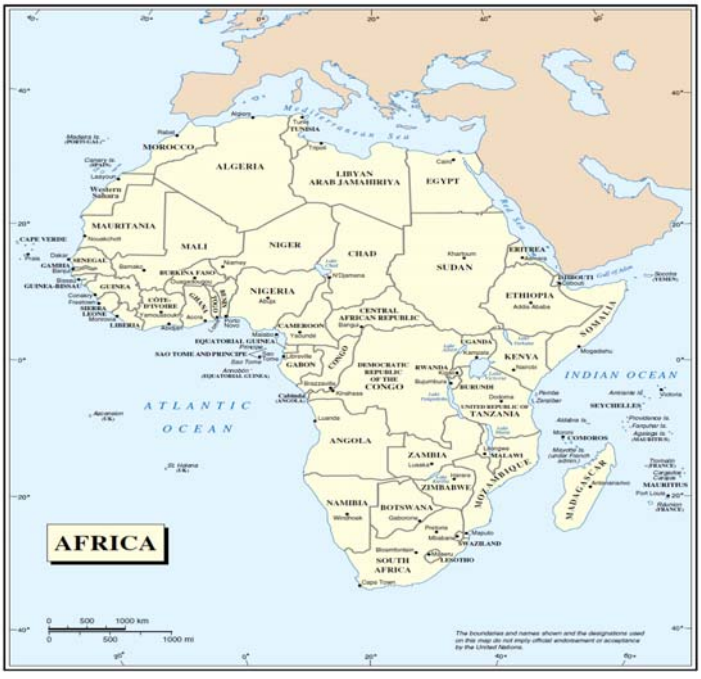

Figure 2.1: Map showing location of Nigeria in Africa

(Source: United Nations, 2009, Department of Field Support. Cartographic Section).

Figure 2.2: Administrative map of Nigeria

(Source: National Bureau of Statistics NBS, 2009).

2.2.2 The construction industry

Corresponding to the situation in general worldwide, the construction activity in Nigeria represents a significant share of the country's economy in terms of its contribution to GDP and total employment, in addition to being an important market for materials and products produced by other sectors of the economy (Ruddock, 2007). Construction according to the United Nations definition comprises of '*economic activity directed to the creation, renovation, repair or extension of fixed assets in the form of buildings, land improvements of an engineering nature, and other such engineering constructions as roads, bridges, dams and so forth'* (United Nations, 2001). However, Ruddock (2007) stated that to consider construction activity as merely the act of building is to include too narrow a set of interests; the issues that construction seeks to resolve are more wide-ranging and represent a considerable economic and social challenge. He suggested that construction activities involve the production and management of the living and working environment of the whole population; in fact, the entire built environment, as distinct from the natural environment (see figure 2.3 for both broad and narrow definitions of the construction industry).

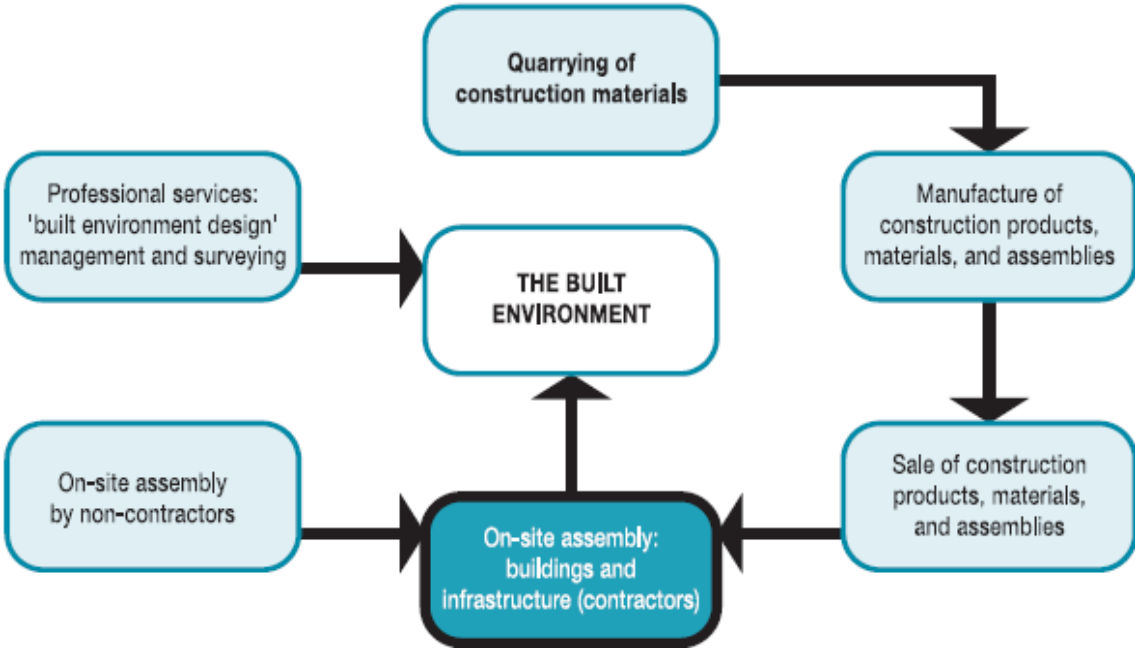

Figure 2.3: Broad and narrow industry definitions

(Source: The Pearce Report, 2003 adapted from Ruddock, 2007).

Therefore, on that basis, the construction industry can be defined as that section of the economy responsible for the production and management of both the living and working environment of the whole population and the entire built environment. DFID (2007) identified the level of social and economic infrastructures as provided by the construction industry constitutes the backbone of the national economy as contributing directly to economic activities, and improvements in human welfare. Walsh and Sawhney (2002) opine that construction activity is an important contributor to GDP in most industrialised countries and contributes significantly to global economic growth. They explain further that its contribution to GDP in the United States in 1996 was around 10.7% and in Australia it was 6.3%. In more recent estimations Ruddock (2007) found that the value-added by construction industry to the economy of United Kingdom (UK) in 2004 was 20%, and in the United States of America (USA) 18% and in Australia it was 18.5%. It is interesting to note that all these countries are already developed economies, yet construction activities still contribute significantly to their GDP.

According to Aboyade (1966), before independence in 1960, the construction sector in Nigeria accounted for about 40% of the total capital formation and after independence, the contribution of the sector to the country had increased to more than 50% on average. The construction industry's contribution to gross domestic product (GDP) in 1960 was 3.8% and this rose to 5.70% in 1975, and then progressively to about 20% in 1980; although it declined by an average of 4% in the late 1980s and 1990s (Anyanwu, *et al.*.

1997). Unfortunately, by 2002, the construction sector's contribution had been eroded to a mere 1% of GDP (AfDB/OECD, 2004). Although, Ofori (2007) quoting Wells, (1986), suggested that *"the role of construction in the economy reaches a plateau when such country attains the middle-income stages as the country progresses in terms of socio-economic development, and then declines as the country attains "developed" status."* However, the reduction in the contribution of the sector to Nigeria's GDP in the 1980s was not due to the fact that the country has reached a developed status; indeed, the WEF (2010) still categorises the country as being at the first stage of socio-economic development, rather it was due to the slump in oil earnings leading to the suspension of many construction projects (Smith, 1993 and Synge, 1993). This was because of over dependency of the country's economy on oil revenues that had shifted from other sources of income such as agriculture, services and production. Moreover; coupled with this were problems such as the high fragmentation of the industry, political instability, prolonged military rule in the country, low productivity, poor quality, and lack of standards, time and cost overruns, all leading to dissatisfied clients (Aniekwu, 1995; Okuwoga, 1998; Adeyemi *et al.*. 2005, and Oladapo, 2007). From the discussion above, it is evident that the construction industry is an essential and highly visible contributor to the process of growth in any country (developing or developed nation). However, in Nigeria, prior to independence, the contribution of the industry can be seen to have increased progressively, thanks to the colonial master (Britain) having observed the need for a vibrant construction of the sector to the economy. The present contribution of the industry to the GDP shows a misplacement of priorities and indicates movement in the wrong direction.

2.3 Construction and Nigeria National Development Plan

It has been recognised by many researchers the world over that the construction industry has strong links to national economic activities and that whatever happens to the industry will directly or indirectly influence other industries and ultimately the wealth of the country (Turin, 1973; Bon and Yashiro, 1996; Martini and Lee, 1996; Threadgold, 1996; Pietro Pietroforte, Bon and Gregori, 2000; Ofori and Lean, 2001; and Ruddock and Lopes, 2006). Hillebrandt (2000) asserts that the construction industry generates income through the sale of its products; the purchase of its inputs and the creation of jobs (Hillebrandt, 2000). For example, the UK construction industry is the biggest employer with over two million people (Dainty *et al.*., 2007) and is the main

single contributor to GDP (Steele and Todd, 2005). The UK construction industry is also the second largest industry in the European Union (EU) and contributes a healthy 8.2% to the UK's Gross Value Added (Department of Trade and Industry, 2003).

Gundes (2011) explains that the strong links between the construction industry and national economies can be viewed from two different directions (i.e. from the demand and supply perspectives). From the demand side, it has been argued that construction activity contributes to the economic growth of a nation by purchasing and making use of products from other sectors, e.g. the manufacturing sector. While on the supply side, the construction industry provides the basic infrastructure that is required for the production of goods and services, which invariably lead to poverty reduction, facilitating the empowerment of the population overall.

Ofori (2007) identified four key attributes of the construction industry as follows: (i) construction makes a major contribution to national socio-economic development by building infrastructure and productive facilities (Wells, 1986); (ii) construction is a large bona fide sector of the economy, contributing a significant proportion of support to the national economy during each period (Hillebrandt, 2000); (iii) construction creates employment as labour-intensive technologies are viable; and (iv) construction takes place in all parts of the country and can be used to develop entrepreneurship, and transfer technologies to all the citizens of the country (Turin, 1973). In line with the suggestion of Quartey (1996) that "*for developing countries to recover from adverse economic conditions, it is imperative for them to achieve and sustain economic growth, through the creation of a congenial macroeconomic environment and pursuit of sound and appropriate policies*". Considering the significant position of the construction industry in the nation's economy, the Nigerian Government in 1999 under the leadership of President Olusegun Obasanjo saw the need to restore trust in the government as a facilitator of development, and as an institution that creates or maintains an environment that enables Nigerians to implement strategies to improve their livelihoods and achieve personal goals.

The government then decided to redirect its efforts towards providing essential services. To achieve this, an economic reform program called the National Economic Empowerment Development Strategy (NEEDS) was implemented. The purpose of NEEDS was to raise the country's standard of living through a variety of reforms, including macroeconomic stability, deregulation, liberalisation, privatisation, transparency, and accountability. NEEDS sought to address basic deficiencies, such as

the lack of freshwater for household use and irrigation, unreliable power supplies, decaying infrastructure, impediments to private enterprise, and corruption. A related initiatives at the state level was the State Economic Empowerment Development Strategy (SEEDS). In order to achieve the aforementioned goals NEEDS focuses on four key strategies: reorienting values, reducing poverty, creating wealth, and generating employment. It is based on the notion that these goals can be achieved only by creating an environment in which businesses can thrive; thus, the government is being redirected towards providing basic services, and people are being empowered to take advantage of the new opportunities the plan will stimulate. Figure 2.4 presents the vision dictating NEEDS at a glance.

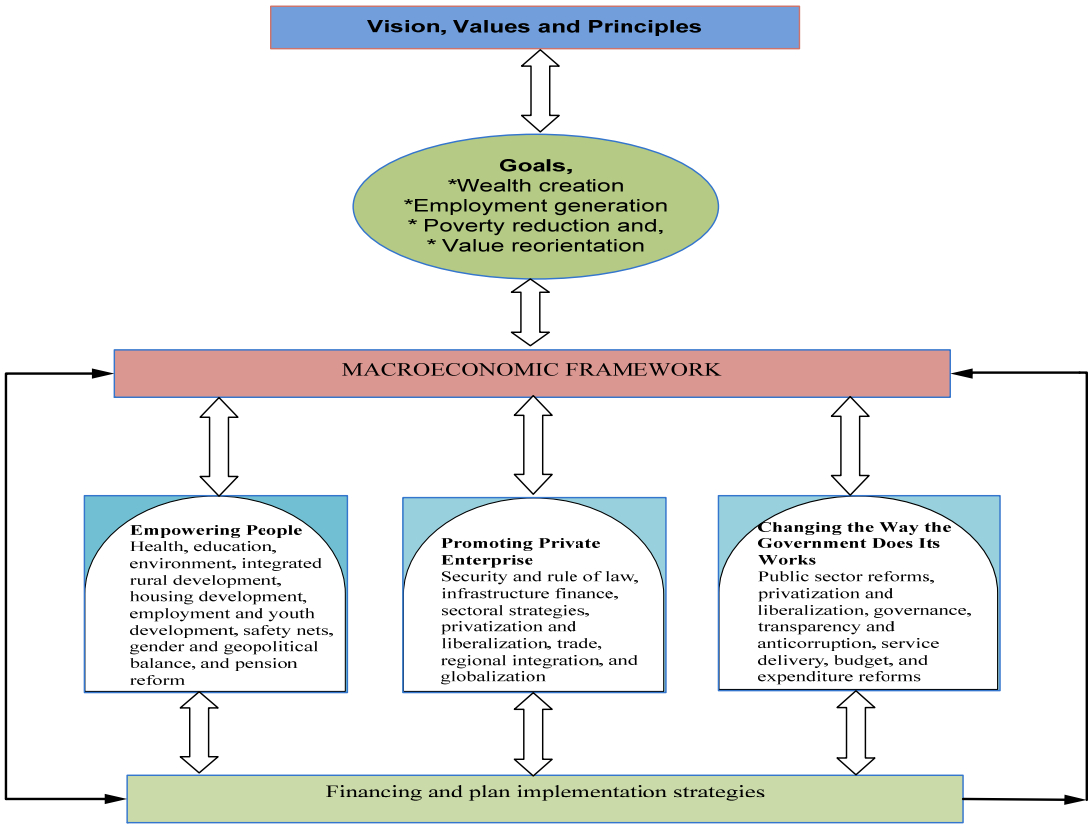

Figure 2.4: The vision of NEEDS at a glance

(source: National Planning Commission NPC, 2004).

In promoting private enterprise**,** the Nigerian government, through NEEDS has encouraged the private sector to become the engine of economic growth. Private sector partners will therefore become the executors, investors, and managers of businesses. The government will then play the role of enabler, facilitator, and regulator, helping the private sector grow, create jobs, and generate wealth. Deregulation and liberalisation will equally diminish governmental control and attract private sector investment. This, to some extent, will reduce the number of government jobs and the cost of running the

government will fall dramatically, it is expected that the savings and this reduction in government spending will be used to subsidise transportation, housing and other utilities as these are monetised in the programme. With regards to changing the way the government does its work, four oil refineries; public housing; and cement manufacturing companies have been privatised. In the energy sector, electricity generation by the Power Holding Company of Nigeria (PHCN) has also been earmarked for privatisation.

Although Nigeria has had a relatively long experience in development planning, prior to the institution of NEEDS in 1999, for example, during the Colonial era, the planning began with the Colonial Development Plan (1958-1968). Other fixed medium-term development plans and National Rolling Plans were also developed and implemented with mixed results. This has resulted in the Structural Adjustment Programme (SAP), the Millennium Development Goals (MDGs) and the 7-Point agenda. All these reforms have seen limited results. Reasons advanced by successive governments in the country, regarding the poor performance of these strategic development initiatives, have been poor implementation and lack of political will to see development strategies through to their conclusion; put another way, there is a lack of continuity. Poor implementation of these development plans implies that the desired results were not derived, meaning that the country's growth and development rates remain stagnant if not in decline.

In 2007 towards the end of his tenure, the Nigerian President, Musa Yar Adua, despite promising to continue with the development policy of his predecessor decided to present another long term development goal termed "The Nigeria Vision 20: 2020" (NV20:2020). The goal of this development plan was to propel the country into the league of the top 20 economies in the world by the year 2020,with a minimum GDP of $900 billion and a per capita income of no less than $4000 per annum (NV20:2020). The direct implication of this to the Nigerian economy is that it must grow at an average of 13.8% during the time horizon, driven by the agricultural and industrial sectors over the medium term, while a transition to a service-based economy is envisaged from 2018 (NV20:2020). Figure 2.5 shows the three pillars of the vision representing the building blocks of the future that Nigerians so desire. A cursory look at all the three pillars of the vision reveals the central role the construction industry needs to play in Nigeria's development. Looking at the first pillar, regarding the vision, which is intended to guarantee the well-being and productivity of the people as shown in figure 2.6, we can observe that the provision of affordable housing, good healthcare services, and portable

water for the people definitely could be achieved through a vibrant and efficient construction sector.

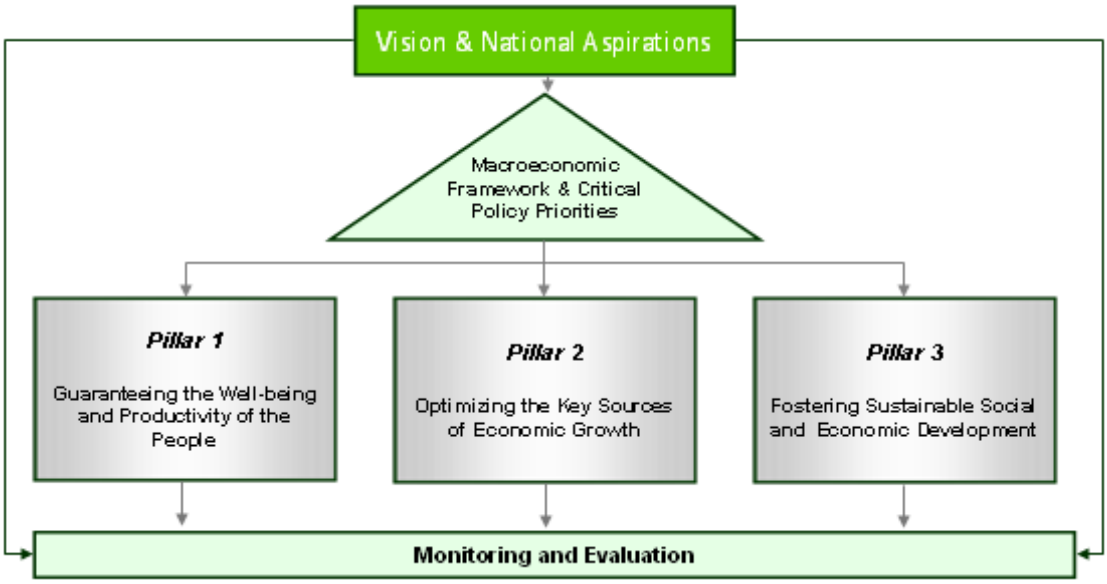

Figure 2.5: The strategic framework for NV 20: 2020
(*Source: The Nigerian Vision 20:2020, Economic Transformation Blueprint*)

Figure 2.6: Pillar I: Guaranteeing the Productivity and Wellbeing of Our People
(*Source: The Nigerian Vision 20:2020, Economic Transformation Blueprint*)

Figure 2.7: Pillar II: Optimising the key sources of economic growth
(*Source: The Nigerian Vision 20:2020, Economic Transformation Blueprint*)

Figure 2.8: Pillar III: Fostering sustainable social and economic development
(*Source: The Nigerian Vision 20:2020, Economic Transformation Blueprint*)

In the same vein, considering the activities laid out under the remaining pillars (i.e. II and III), there are advantages, especially the third pillar which relates to fostering sustainable social and economic developments in the country. It is evident that construction sector in Nigeria occupies a focal point in terms of the realisation of the development vision of the country, making it central to the achievement of desired levels of productivity, economic growth, national development and overall wellbeing of the people. Ogunlana (2010) at an annual lecture series on 'sustaining the vision 20:2020 through construction', asserts that, the vision seems like an excessive amount to achieve when one considers how long it has taken the country to reach its present status, still remaining among the less developed countries. However, he suggests that the country does need to evoke proactive strategies avoiding accusations amongst the stakeholders about reasons for earlier failures; it is necessary for all interested parties to contribute willingly towards the team goal of realisation of the vision. To this end Ogunlana advocated the establishment of a Construction Industry Development Board (CIDB), which would function like those which exist in other countries such as Singapore, South Africa and Malaysia with success stories regarding achievements of their goals and visions. Therefore considering the significant position of the construction industry in the nation's economy, there is certainly a need for improved efficiency, productivity, administration and management of construction activities with adequate solutions to the setbacks and problems confronting the industry; this is in line with the opinion of Ofori (2007) considering all the attributes related to the industry.

Therefore, there is urgency for more research to be undertaken regarding the proposed necessary action which must be taken now in order for developing countries like Nigeria to derive the greatest benefits from the contribution which construction can make to national growth and development.

2.4 Infrastructure development in Nigeria.

After many years of neglect, as evident from the dwindling contribution of the construction industry to the GDP in Nigeria; infrastructure is once again back on the development agenda, with renewed emphasis on its role in growth and poverty reduction (Estache, 2006). It is imperative therefore to understand what constitutes infrastructure in any nation, and the importance of these infrastructures to the citizen and the nation at large. In this regard, Jerome (2009) opines that there is no ironclad definition of infrastructure. The term infrastructure has been commonly discussed in terms of its characteristics (i.e. longevity, scale, inflexibility, and higher investment cost). WEF (2010) suggest that infrastructure can mean different things to different people and communities. Indeed, even in the case of infrastructure finance practitioners there has often been little consistency in terminology. For example, from a financing perspective, any definition will need to capture the fact that infrastructure opportunities are usually capital-intensive and include a tangible asset that must be operated and maintained and that will generate stable long-term cash flows (WEF, 2010).

Time has caused a consensus to emerge, regarding the existence of the two types of infrastructure projects; social and economic infrastructure. Social infrastructure on the one hand involves project that are built and/or operated to support the provision of public services. While on the other hand, economic infrastructure involves projects that support economic growth by providing and operating infrastructures that are needed for a country or region to function. Good examples of social infrastructure include health facilities, market facilities, schools, housing, and prisons. Examples of economic infrastructure includes transport facilities, utilities (water, gas, and electricity), and telecommunication networks. These two distinctive infrastructures underpin the development plans of all developing nations, Nigeria included. Willoughby (2004) acknowledged that the contribution of infrastructure to halving income poverty and achieving Millennium Development Goals (MDGs) is its most significant objective. The importance of infrastructure to non-income aspects of poverty, improvements in health, education and social cohesion, to mention a few cannot be overemphasised. In fact, strong national growth is always a function of adequate and well functioning infrastructures that underscores both the production and free flow of goods and services within and outside the country.

Oluba (2008) when discussing the importance of infrastructure in a given economy has stated that with a good infrastructural base, development is both easily attainable and

sustainable. Let us take for example, when there is adequate electricity, companies as well as individuals can operate independently. They can make optimal use of their time as well as of modern technologies and processes. Moreover, transportation infrastructure such as roads and railways facilitates the efficient movement of goods and services to locations where they can best be used; promoting exchange, which is fundamental to economic growth. This applies also to market facilities, without which many products cannot reach their prospective buyers as the market provides an environment in which buyers and sellers can interact. Efficient infrastructure development therefore underlies the integration of the national economy and helps in spreading its benefits, thus having a significant role to play in national development. It is therefore imperative to examine how these much needed infrastructures are financed and procured, and to be aware of any possible shortcomings in their provision.

2.5 The market as an infrastructure and its development

Markets may function following a variety of different systems, institutions, procedures, social relations and infrastructures, whereby trade and goods and services are exchanged, to form part of the economy. Markets vary in size, range, geographic scale, location, types and the human communities involved, as well as the types of goods and services traded. Some examples include local farmers' markets held in town squares or parking lots, shopping centres and shopping malls, international currency and commodity markets, legally created markets such as for pollution permits, and illegal markets such as the market for illicit drugs. Although many markets exist in the traditional sense of a marketplace, there are various other types of markets and various organisational structures that can be instigated to assist in their function; for example, money markets, stock markets, bond markets, commodity markets and currency markets. The principle interest of this research is in the market as a place, i.e. as an infrastructure whereby people can trade and where goods and services can be exchanged.

2.5.1 Historical background to markets

Human society dictates the tradition that wherever a community is formed, the necessity for order and control becomes apparent. Historically men assemble at the gates of the individual who has attracted other people to a place and formally recognise him as the mayor, or father of the land. Then henceforth, this authority becomes perpetuated by the

descendants of this individual. The house of the mayor/father of the land becomes the official residence, and is kept in good repair by the men of the town, leading eventually to the establishment of the market of the town in the centre in front of the house of the chief ruler (Hodder and Ukwu, 1969).

During medieval times in Europe, according to Coleman (2006), the market and the town halls were the focus of trading and business activity and were located, along with the market square, in the centre of the town. The early market and town hall building combined these two uses and were typically two-storey buildings with a council chamber in the first floor for administering the town, and the market. The ground floor remained open between the columns and was used as an extension to the open market square. Trading and display of goods took place across removable stalls; one of the earliest surviving examples of this combined use building is the Palazzo de Broletto in Como, Italy, inscribed 1215 (Coleman, 2006).

However, with growth and prosperity in the towns, the market grew, leading to the ground floor becoming walled, wings being added and court yards formed to comprise the ground town hall building. A good example of this arrangement can be found in the city of Fez in Morocco (Coleman, 2006). Coleman observed that, medieval trading consisted of live stock, agricultural products, craftsman's tools, leather ware and clothing. The largest bazaar is Istanbul's Grand Bazaar (Turkish Kapalicarsi), which covers a single area of 200,000m2 (20Ha) forming a whole district within the city. These open or covered markets and bazaars developed into sophisticated arcades (The Galeria in Milan, Burlington Arcade London and Kyoto, Japan) on the one hand, and on the other into the street market which still operates throughout the UK. The shopping street became the alternative to the market; this was generally an organic development seen on the High streets, where the ground floors of domestic buildings were often gradually transformed into shops. Simple local shopping started to change in the 19th century due to population growth and concentration (Coleman, 2006). Today there is a need for big shopping malls as the railway, and the motor car have brought mobility to both goods and consumers; in addition, the development of packaging, food preservation, direct advertising from manufacturer to consumer and the accelerated growth of the big manufacturer has led to wider distribution of both the population and goods outlets.

Shopping facilities are an expression of the market. Fundamentally, they provide a showcase for manufacturers to sell their wares. They are part of a large, sophisticated

and dynamic industry tied into the economy of a country, its regions and districts. They also reflect basic human activities, such as consumption and trading. They have been integral to human settlements from the earliest times and have grown at the heart of our towns and cities.

2.5.2 Characteristics of markets in West Africa

Markets throughout the country can be said to exhibit the same characteristics. The most striking and distinctive characteristic of markets in the entirety of West Africa and Nigeria in particular are their centrality within any given community. This is according to Dennis, Marsland and Cockett (2002) in line with Central place theory. This is based on classical economic assumptions such as the uniformity of consumers and travellers as described by Brown (1992, p. 40). Based on the work of the German geographer, Christaller (1933) and economist Losch (1940), the theory, according to O'Brien and Harris (1991), was widely accepted by the planning profession as a model of retail organisation. In recent decades, the theory has been criticised by other researchers, for example Dawson (1979, p.190), as flawed because of the complex nature of retailing and scrambled merchandise mixes. Another important characteristic of market is the social structure of the trading community. Females constitute the majority of traders; and in certain sectors of trade, e.g. selling of food, beverages, and cloth and household goods, market-women hold a monopoly (Vagale, 1974). Vagale (1974) further asserts that in certain markets it was observed that 90% or more of the traders are females, while in others women account for less than 50% of the total number of traders. Examples of markets that are dominated by men are those that deal in meat, planks/timber, cattle, motor engines and other specialised items requiring physical strength on the part of the traders.

According to Vagale (1974), there seem to be several reasons for this dominance of women in trading: (i) Yoruba women do not play a major role in farm work; however, they play a dominant role in harvesting and selling farm products and in certain handicrafts like weaving, dyeing and pottery. Young girls assist their mothers and sisters in trades and crafts; (ii) a young woman inherits a trade or skill either from her parents or from her husband's family; (iii) the farm products need to be processed before they can be used. Women therefore, engaged in processing agricultural products and selling foodstuffs. Making palm oil, preparing 'gari' from cassava, cooking 'Akara', 'Amala', 'eko' and producing other food items.

Moreover, Guy (1994) stated that the main characteristic that distinguishes retail development from other types is the need to lease all units in a centre to tenants before that centre can be opened for trading. According to him, building speculative developments, which are intended to be let to tenants after completion, is unwise as a partially unlet shopping centre may not have sufficient variety of shops to attract customers, meaning it can rapidly become untidy or vandalised, and is hence seen by the market as a failure. These considerations therefore suggest that retail development incorporates two important stages that are sometimes absent from other types of property development. First, there is the need for research on the demand for retail space in particular location: many retail firms have very precise positioning requirements. Not only does total demand have to be sufficient for a proposed scheme, but the nature of the scheme itself will reflect the level of demand from different types of retailer. Second, negotiation with prospective tenants or long-term retail purchasers is a vital part of the development process.

Furthermore, retail development has to be justified initially by a calculation showing that the rents obtainable from the scheme represent an acceptable yield; and that the realisation of the market price, compared with costs of development, represents an acceptable level of profit for the developer. However, rents have to be related to what the tenants are actually prepared to pay, and are thus assessed on a comparative bases, either in relation to existing rents for prime locations in the same town, or rents in new developments elsewhere (see Morgan and Walker 1998 for more on rent setting).

Finally, an unusual feature of retail, compared with other types of property development, is that completed schemes are often managed by the ultimate owner of the scheme. Management is necessary to maintain the high standards that help to attract customers, and to provide common services including security, cleaning, and maintenance of circulation/pedestrian areas, lighting, air conditioning, landscaping, and the promotion and marketing of the centre as a whole. These services are paid through service charges, which are demanded from tenants. Retailers often complain that, while rents are normally fixed for five years, service charges often rise from year to year.

2.5.3 Importance of Markets to National Development

Markets in Nigerian towns play a vital role in the economic and socio-cultural life of the people in urban as well as rural areas. The growth and importance of several towns is intimately bound up with the prosperity of existing markets (Vagale, 1974). As mentioned earlier in the justification for the study, a market has both economic and non-

economic importance in any given community deriving from development through to eventual use. Markets generally form the heart of a town or city centre. They affect our environment and become a place we identify with, serving as backgrounds to our social and leisure, often forming memories we grow up with and look back on. Following are some of the importance of market to growth and nation development.

Retail property is one of the most important investment categories in the UK. Those employed in the retail industry constitute a large proportion of the country's workforce. For example, 20% of the workforce is employed in the retail industry (British Council of Shopping Centres Report, 2001). According to the report, this makes the retail industry the second largest employer in the country, only marginally exceeded by a declining manufacturing industry. This figure does not include the many consultants and development teams that have become involved in creating and bringing together the shopping centre, nor those who build and operate them. Shopping centres have seen steady growth in Canada, solidifying their position as major hubs of economic and social activity in communities, across the nation. According to the International Council of shopping Centres (ICSC), shoppers at Canadian centres spent $111.5 billion in 2001 (up from $106.4 billion in 2000), representing 46% of Canada's total non-automotive retail sales (including sales of restaurants and taverns). In the same report, Canadian shopping centres were reported as having employed 1,209,400 people in 2001, representing 10% of Canada's total non-agricultural work force. At the end of 2001, there were 4,389 shopping centres in Canada containing 343.3 million square feet of gross leasable area (GLA) (ICSC, 2002).

The trends in the economic and physical profiles of the markets support the assertion that markets will continue to dominate the urban scene and persist as vital components of the wholesale and retail structure in Nigeria. Vagale (1974) argued that although the increasing tempo of urbanisation, diversification of economy and improvement in transportation, have tended to cause a decline in the importance of markets in the developing countries of Asia and Latin America, where trading streets and department stores offer formidable competition to the traditional markets, the socio-cultural context of Nigeria and the economic conditions of the country may prevent such a phenomenon occurring in Nigeria. There is also the question of whether such change should be allowed to happen, if the network and hierarchy of distributive trade is to be strengthened.

2.6 Infrastructure Financing

Infrastructure provision, be it social or economic, can occur in a variety of ways, which comprise: government ownership with government management, government ownership with private management, public-private ownership and joint management, private ownership and management, community provisioning, etc. Usually government/public authorities pay for the building and operation of social infrastructures while in the case of an economic infrastructure individual users pay directly for their use. This assertion concurs with that of Grimsey and Lewis (2002) that the provision of infrastructure should be focused on government-owned enterprises, as was the predominant approach in Europe, or on privately owned utilities which are subject to rate of return regulation, as practiced in much of the United States. In most developing and under-developed countries, such as Nigeria, owing to the established pattern, provision of infrastructure has been the prerogative of the government (Oluba, 2008). Infrastructures are then financed through domestic savings or through foreign assistance by way of grants or loans. This method of financing, i.e. government financing has its own limitations. According to Baum and Tolbert (1985) domestic savings are not always adequate due to shortfalls in revenues and escalating expenditures. Foreign lending, which supports such arguments are also insufficient as donors can seldom cater for all the development needs of recipient countries. Therefore development is often not occurring at its optimum rate. Projects have to be phased and sometimes packaged impractically both in terms of size and technical interfacing. Moreover, to obtain foreign funding there is a need to provide sovereign guarantees.

Unfortunately, in such situations, the provision of the infrastructure is intertwined tie with regulations, which rather than improving efficiency and lowering prices, actually produce contrary effects. The results lead to the entrenchment of monopolies characterised by the wastage of valuable resources in trying to maintain the monopoly status. New ideas, and new and better ways of conducting exactly the same business or activity are often suppressed, and consequently in the absence of competition cause a severe deterioration in quality. Harris (2003) affirms that public sector monopolies have a tendency to be plagued by inefficiency and have failed to expand services to meet rapidly growing demand. He argues that many were strapped for resources because governments succumbed to populist pressures to hold prices below cost, notwithstanding that the beneficiaries of these subsidies were usually not the poor. Clarke and Wallsten, (2002) suggest that overstaffing, mismanagement, and diversion

of revenues by employees who are employed to manage utilities, were responsible for the poor performance of public utilities in the developing countries. Moreover, experience has shown that in most developing countries, revenue generated from the use of most infrastructure facilities is usually inadequate and unsustainable. Bazin's (1996) study of 60 developing countries found that half of the utilities in operation had very low rates of return and incurred several losses. Palmer (1986) observed that projects deteriorate much faster than expected in the case of publicly owned utilities because of the poor culture of basic routine maintenance.

The situation in Nigeria presently attests to all the assertions made by different authors evaluating the state of public owned infrastructures. Today, there is a huge infrastructure deficit in the country. This in turn has greatly constrained the country's economic growth and development, thus inhibiting the ability of the governments at all levels in the country to improve the quality of life to Nigerians. However, the country's rich human and material resources and endowments give the country potential to become Africa's largest economy and a major player in the global economy. However, mismanagement and corruption have made that position a mirage over a long period. Nigeria with her huge oil wealth and insufficient funding from both the Federal and state government has been responsible for the dearth of infrastructure in the country. The WB, in a report on credit proposed to the federal republic of Nigeria in the amount of SDR 73.7 million (US$115 million equivalent) for the first phase of the PPP program in the country, lamented the huge costs resulting from the poor infrastructure in the country, when looking at the indirect costs borne by Nigeria's firms (see figure 2.9 for the breakdown of these indirect cost which are predominantly infrastructure related). The report surmised that these figures amount to 2 percent of the sales in a South African firm, 5 percent in a Chinese firm, 10 percent in an Indian firm and a massive 16 percent in a Nigerian enterprise. This competitive deficit translates into eroded profits and lost jobs (WB, 2011). From the ranking of the majority of the firms in Nigeria it is evident that the poor infrastructure in the country is a serious problem. The report also asserts that this high infrastructure deficit in Nigeria and lack of competition in service delivery is also retarding its ability to achieve the MDGs. It was revealed in the report that the infrastructure gap in Nigeria requires capital investments totalling around US$100 to US$111 billion, which does not include subsequent maintenance and recurrent costs. (The breakdown by sector is as follows: US$18-20 billion in power, US$8-17 billion in rail, US$14 billion in roads, and US$60 billion in oil and gas). Presently, the investment in infrastructure in Nigeria is about 7% of the GDP which

includes investments from both the public and the private sector. This is according to the WB report (2011), although it is above the average for a Sub-Saharan Africa region; it is well below what countries such as Mozambique in the same region is investing on infrastructure and China (on the Asian continent) who are investing 12% and 14% respectively. It is disheartening to note that instead of directing a greater portion of the country's resources to infrastructure, the Nigerian government is focused on increasing recurrent expenditures while capital expenditure suffers. For example, in 2010, out of the total spending of N4.1 trillion in the country (according to the 2010 budget), about N1.3 trillion representing 31.7% was apportioned to capital expenditures. In the same vein the country's proposed budget of N4.226 trillion for the year 2011 has a projected deficit of 3.62% of the GDP (Jonathan, 2010).

In the proposed budget, N542.38billion has been earmarked for debt servicing, an amount that is more than 50 per cent of the amount allocated to capital projects (i.e. N1, 005.99 billion), and recurrent expenditure in the budget is considerably above capital expenditure, meaning that the pay from the government to its employees is greater than the amount spent on the work those employees are going to do. Based on practices in other oil based economies it would be reasonable to expect that the country would have utilised the excess money resulting from the escalating price of crude oil to improve its infrastructure, especially at this time when there is civil unrest throughout the region. However, instead the legislative arm of the government sank profits into improving their own salaries, a practice that is unlikely to prove popular with the populace, or support economic growth and stability for the country.

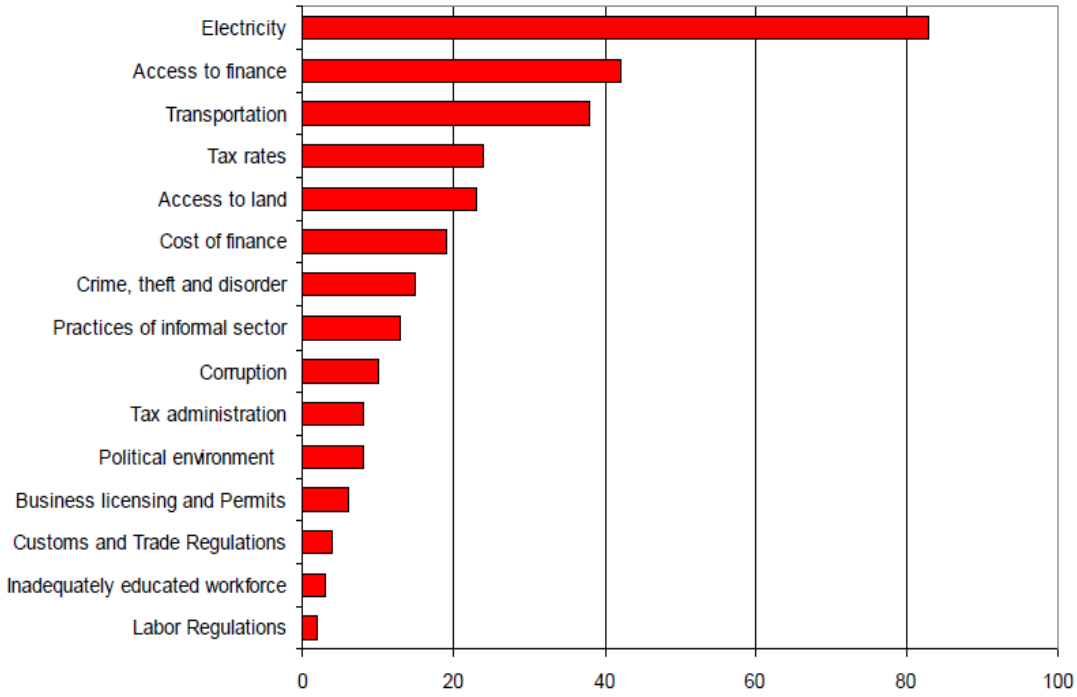

Figure 2.9: Ranking of major constraints to doing business in Nigeria

Source: Adapted from WB (2011) report.

2.7 Market financing and the need for alternative procurement route

Just like other infrastructural facilities, market/retail development requires huge capital outlay for development and maintenance purposes. In addition, because of the complex nature of the project at the current time, it also requires some technological knowledge from public enterprises who have formerly been the sole providers of such facilities. Up until the present time, retail facilities have been seen as solely related to social infrastructure. Therefore, governments (either State or Local) have been responsible for the financing, construction and subsequent management of these facilities. Conventionally the government as owner, only collects a small amount of money as a nominal tariff for using the facilities. In the case of shop owners at a market this takes the form of rent; in the case of other traders at the market daily charges are applied on the basis of use. This money forms part of the government's internally generated revenue and is used for maintenance of the facility.

Today, almost all the central/main markets in the country are in a state of disrepair. A review of the state of these retail facilities in the city of Ibadan, in the south western part of the country by Vagale (1974) revealed the parlous condition of these facilities at that time. It is highly disheartening to note that things have not improved since then rather they are just becoming worse and worse by day. He was forced to conclude that markets

in Nigeria were in serious need of improvement or re-building in order to be able to function as efficient, clean and viable socio-economic institutions, as integral components of urban and regional systems. To achieve this, he suggested that some markets be closed, some relocated, and that many others will require substantial improvement or re-building to support an overall plan for the development of the city and the region. Therefore, considering the importance of market and the current economic situation in the country, there remains a need to evolve a proactive approach to understanding how this much needed infrastructure can be procured within the purview of the resources of the government in a sustainable way. This in turn will depend on the choice of the right procurement route for the development of the infrastructure. It is evident already that the methods presently in use have failed to yield the desire objectives or result in a satisfactory transformation. Thus, a change to this situation, wherein the government can solely finance and construct infrastructure would be expected in a collaborative system to allow both public and private partners to develop together a much needed infrastructure since its existence, functionality and reliability are separately and jointly of importance in achieving and sustaining economic growth. Before elucidating on what this collaborative system would be, it is imperative to first look at various ways by which infrastructure can be procured and then look at the way this has altered over time.

2.8 Procurement of Infrastructure and their transitions

The terms 'contractual arrangement' and 'procurement system' are normally used synonymously. Procurement of construction work has been defined as the framework through which construction is brought about, acquired or obtained (Sharif and Morledge, 1996). The definition adopted by Love, Skitmore and Earl (1998) in their study is that a procurement system is 'an organisational system that assigns specific responsibilities and authorities to people and organisations, and defines the relationships of the various elements in the construction of a project'. According to Anumba and Evbuomwan (1997) the choice of a procurement route for construction work is one of the many important decisions that construction clients have to make. Moreover, they argue that it is important for clients to objectively assess and prioritise their requirements in order to enable a rational comparison of alternative procurement routes. The choice of the route which best matches the client's requirements can then be made based on the relative advantages and disadvantages of the alternatives, against the criteria defined by the client (Anumba and Evbuomwan, 1997).

Many studies have been commissioned in last seven decades to understand the reasons behind the poor performance of the construction industry. For example, the Simon Report was commissioned in 1944, the Philips Report in 1950, the Emmerson Report in 1962, the Banwell Report in 1964 and the Tavistock Report in 1966, the NEDO Report 1983 and a further NEDO Report in 1988. In addition, two decades ago, similar studies were directed towards reviewing the performance of the industry in the UK, such as those of Latham (1994) and Egan (1998). All these studies echoed an underlying dissatisfaction from both clients and end users on the performance of the construction industry. When using the UK as an example, the story is no different to that in other parts of the world. They have argued that the poor performance and the dissatisfaction of clients in the industry arise from poorly structured procurement systems, the fragmentation of the industry (i.e. differing professions or actors coming together) and the adversarial contractual cultures within the industry. Traditional design-led approaches, which occurred largely as a natural development following the rise of the architectural profession throughout the seventeenth and eighteenth centuries in the UK, have been blamed for the adversarial problems in the industry (Morledge *et al.*., 2006). They argue that, although, the traditional procurement method held sway for more than 150 years, by the early 1960s problems arising from the separation of design and construction functions, often evidenced by the difficulty of apportioning responsibility for defects in completed buildings, led to the development of what have been called 'integrated procurement systems (Masterman, 2002) generally based upon a design and build approach.

According to the literature consulted it was found that the use of management oriented procurement strategies date initially from the 1920s, but the approach was progressively developed in the USA in the late 1960s, and more rapidly during the 1970s, as a direct result of government pressure to improve predictability and reduce construction delays through better process management (Morledge *et al.*., 2006). The high interest rates in the 1980s contributed significantly to the recession between 1979 and 1982 and meant that UK banks had been exposed to about £500 billion of property related debt by the end of the decade (Cartlidge, 2010). It was during the 1980s when the Conservative government introduced compulsory competitive tendering (CCT) for public sector projects, which later spread to private sector projects, that design and build procurement began to see a rise in popularity as clients' perceived this as a strategy by which to

transfer some risk to the contractor. The Latham and Egan Reports recommended fundamental changes in procurement practice and in 1999 the construction industry started to come to terms with the new approach. At that time predominant forms of procurement during involve partnerships, PPP/PFI and design and build. Table 2.1 shows a genealogy of procurement between 1934-date (for more details on the different procurement strategy and factors that influenced these strategies at any particular point in time during the period (see Cartlidge 2010).

Table 2.1**:** A genealogy of procurement

Dates	Economic milestones	Procurement trends	Construction activity
1934-1945	Few corporate clients.	Sequential, fragmented process. Bills of quantities, competitive tendering.	Traditional approach.
1946-1969	Post-war regeneration.	High value= Low cost Lump sum competitive tendering Cost reimbursement.	Rebuilding post-war Britain.
1970-1979	Rampant inflation 25% + pa Historically high interest rates.	Management contracting. Two stage tendering.	Property boom 1970-1974.
1980-1989	1989 base rate reaches 15%. Financial deregulation. Privatisation. 1987 inflation reaches 7.7% pa 1987 Stock market crash.	Construction management. Management contracting. CCT. Bespoke contract to load risk onto contractors.	Property slump 1980-1984. Property boom 1985-1990.
1990-2000	Globalisation. Low interest rates and inflation. World economic slump.	Partnering. PPP/PFI.	Property slump 1991-1997. Property boom 1997-2000.
2001-2008	Globalisation. Sustained economic growth. Low interest rates and inflation.	e-Procurement. Prime contracting. Relationship contracting.	Property boom.
2009- date	Sub-prime market collapses End of ten years of economic growth.	Design and construct. Lump sum competitive tendering.	Slump in housing. Sector, credit crunch.

Source: Adapted from Cartlidge, 2010.

In view of the above, it is apparent that the development of construction procurement approaches has historically been driven primarily by perceived deficiencies in previous popular approaches, a process described by Cox and Townsend (1998) as 'barefoot empiricism'. From the above, it is easy to categorise the various procurement uses according to two broad categories as Traditional and Collaborative approaches to project procurement. This categorisation agrees with the opinion of Love *et al.*. (1998), who categorised procurement systems into two as traditional methods and Management methods. The two categories are discussed in turn below:

2.8.1 Traditional procurement strategies (Design-bid-build).

Traditional methods of contracting generally involve employers or their agents designing or at least specifying in detail the work required prior to competitive tenders being invited from group of construction contractors. Cartlidge (2010) asserted that during the 1960s in the UK, the design-bid-build procurement strategy was the most commonly used form of construction procurement with approximately 60 plus of all contracts being let on this basis in both the public and private sectors. Morledge *et al.* (2006) suggest that the strategy is seen as the least risky approach due to the fact that there is a level of certainty about design, cost and duration inherent in the strategy if it is properly implemented. The implication of this is that in order to assure low risk, the design has to be completed before competitive tenders are invited and before the main construction contract is allocated. This means that the strategy will be relatively slow or time consuming. It has been argued that the strategy may fail if any attempt is made to appoint a contractor for the work before the design is complete. Morledge *et al.* (2006) suggest that such action will probably result in many post-contract changes which could delay the progress of the works and increase costs. Different variants of the traditional system have been developed over the years to correct this problem. It is possible to have an accelerated traditional procurement strategy where some level of design overlaps construction. Another way to achieve this is to implement a two-stage process, or by negotiation. Figure 2.10 shows a typical organisational structure of a traditional system. Design-bid-build and Design and construct methods are common methods utilised under this strategy.

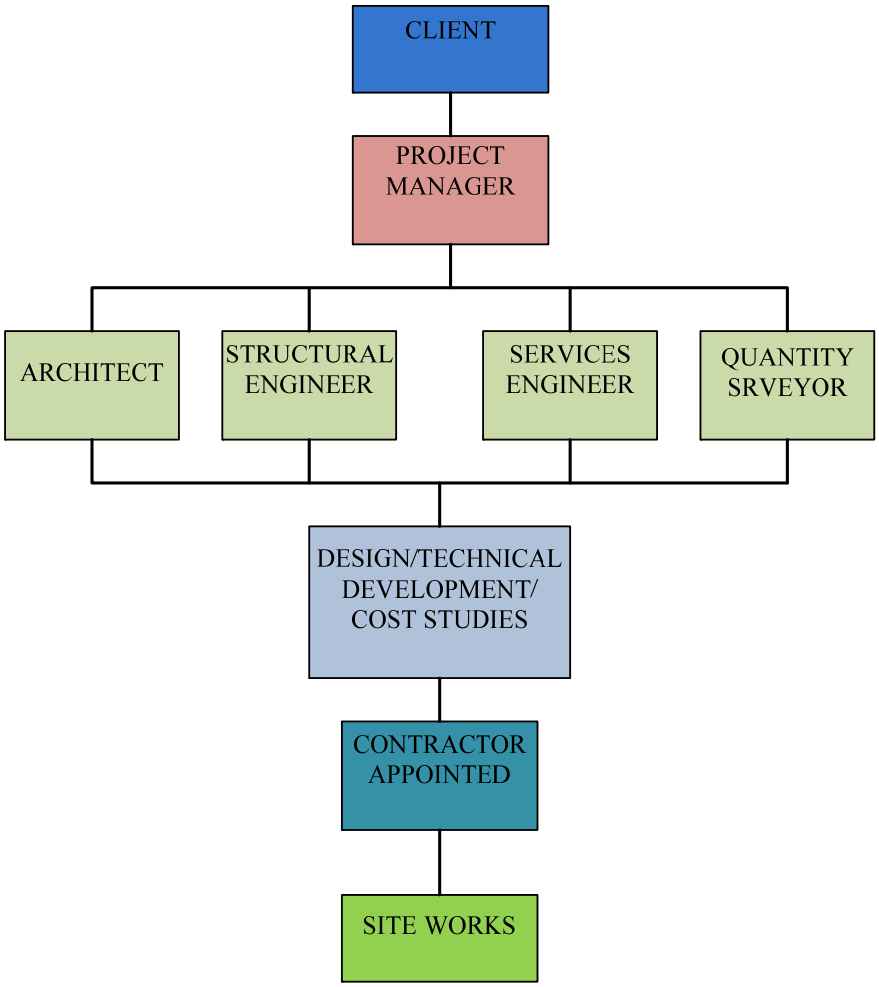

Figure 2.10: Traditional procurement

Source: Adapted from Cartlidge (2010)

The traditional procurement system has the following advantages and disadvantages:

Advantages of traditional procurement strategy:

(i) Since all tendering contractors are bidding for the same project this assures equitable competition;

(ii) Relatively low tender preparation costs;

(iii) Satisfactory public accountability since the system is transparent and based upon competition;

(iv) Changes are reasonably easy to arrange and value where the design needs vary due to changes in client needs or technology;

(v) The procedures are well known, enabling confidence to be assured in those involved throughout the supply chain;

(vi) Since the client has a direct influence on the design, this facilitates a high level of functionality and bespoke quality in the design.

Disadvantages of traditional procurement strategy:

(i) There is no input into the design or planning of the project by the contractor, who will not be appointed at the design stage; thus we have poor build ability and this leaves the design risk solely with the client;

(ii) The system is based upon price competition and this can result in adversarial relationships developing;

(iii) The overall project duration may be longer than that involving alternative strategies, as the strategy is sequential and construction cannot be commenced prior to the completion of the design;

(iv) Though, it is possible to attempt to speed up the process by producing tender documents from an incomplete design, this will usually result in less cost and time guarantee and can be the cause of expensive disputes.

2.8.2 Collaborative/Partnering approach to project procurement

Awodele and Ogunsemi (2008) reported that from the available literature (CII, 1991; Cowan *et al.*., 1992; Moore *et al.*.,1992; CII, 1996; Bennett and Jayes, 1995; Barlow *et al.*., 1997; Bennett and Jayes, 1998; Bresnen and Marshall, 2000) that it is very clear that different perceptions affecting partnerships prevail. There is conformity over the general concept of partnering as a cooperative relationship between business partners in the construction industry, formed in order to improve performance in the delivery of projects, but there is considerable variation in definitions. This inconsistency is undoubtedly due to the different world perspectives of the authors and variations in the development and implementation of partnering between national industries and also within national industries. Confusion over definitions is further fuelled by the often imprecise use of the term partnering in industry literature. This general use of partnering without further detailed references is, in fact, often counter-productive and tends to propagate the perception of partnering as a fuzzy concept as discussed by many but which few understand.

Barlow *et al.*. (1997) conclude that partnering is best considered as a set of collaborative processes. Processes which seek to emphasise the importance of common goals and raise questions such as how such goals are agreed upon, at what level are they specified and how are they articulated? Chris (2004) stated the following generic definition as it reflects the views held in the majority of the literature reviewed:

- Partnering is a set of collaborative processes rather than simply a form of relationship;
- Partnering is a co-operative arrangement between two or more organisations based on mutual objectives and increased efficiency through shared resources, open communications and continuous improvement;
- Partnering is applied either via project partnering or via a long-term relationship known as strategic partnering;
- Project partnering is typically practised at a first generation level or at a more developed, more committed second generation level (mature partnering) (Baird and Bennet, 2001).

The Construction Industry Institute (CII 1991) defined partnering as a long-term commitment between two or more organisations for the purposes of achieving specific business objectives by maximising the effectiveness of each participant's resources. This requires changing traditional relationships to fit within a shared culture, disregarding organisational boundaries. This relationship is based on some certain key elements:

- Commitment: this must come from top management since a jointly-developed partnership charter is not a contract but a symbol of commitment;
- Equity: all participants' interests are considered in creating mutual goals and this is to satisfy each participant's requirements for a successful project by utilising win/win thinking;
- Trust: teamwork is not possible where there is cynicism about the motives of others'. Through the development of personal relationships and communication about each participant's risks and goals, there is a better level of understanding. With understanding comes trust and with trust comes the possibility for a synergistic relationship;
- Development of mutual goals/objectives: at a partnering workshop the participants identify all respective goals for the project in which their interests overlap. These jointly-developed and mutually agreed goals of each party, limit escalation of costs and require review periods for contracts.

Based on the above, it can be argued that procurement strategies such as Alliancing, Prime Contracting, Joint Venture and Public Private Partnership (PPP)/Private Finance Initiative (PFI) (although they do not have the same legal connotations) are all contracting relationships that are based on partnering principles that are currently being

used in one form or another worldwide. Table 2.2 presents the differences between traditional and collaborative project procurement systems.

Table 2.2: Differences between Traditional and Collaborative Procurement system

Type of Issue	Traditional system	Collaborative system
Atmosphere.	Win-lose attitude.	Equal partner attitude.
	Adversarial problem solving.	Join problem solving.
	Formal, contractual relations.	Cooperative, teamwork environment.
	Frequent contract claims.	Few contract claims.
Relationship.	Project-by-project contracts.	Long –term contracts.
	Independent project teams.	Joint project teams.
	Risks transferred.	Risks shared.
Barriers.	Continuous improvement discouraged through short-term contracts.	Continuous improvement required, or at least encouraged.
	Only essential information shared.	All useful information shared.
	Limited cost discussions due to competitive advantage.	Cost and profits freely discussed.

Source: Adapted from Kloppenborg, 2009

Based on Black *et al.*. (2000) and Chan *et al.*. (2005), the benefits of collaborative systems can be summarised as follows: (i) reduction in costs and time of project implementation, (ii) establishment of favourable and less adversarial relationships, (iii) risk sharing, (iv) operational cost savings, (v) increased implementation speed, (vi) construction projects cost savings, (vii) quality improvement, (viii) access to skills, experience and new technology, (ix) improved design, (x) increased understanding of parties, (xi) increased customer satisfaction, (xii) enhanced economic growth of a nation, (xiii) facilitate creative and innovative solutions, (xiv) true costing and true value, (xv) enhanced facility maintenance, (xvi) improved return on resources, (xvii) increased revenue generation for national development, (xviii) improved administration, (xix) improved financing options and (xx) reduced risk exposure etc.

The above list can then be used to justify the shift from the traditional procurement system to the collaborative system that actually prevents adversarial relationships and

fragmentation in the industry, which have been identified as major causes of poor performance of the industry.

2.9 Summary and Literature gap

This chapter has examined the findings from the review of extant literature on issues like the nature of the construction industry in the wider world and in Nigeria in particular. Moreover, the importance of infrastructure to any national development with special emphasis on Nigeria's national development has been illuminated. Emphasis has been placed on the development of markets in Nigeria, and, this has involved an examination of much needed infrastructures (i.e. Markets) that have been financed in the past and the need for a shift in the financing process to a more collaborative procurement similar to PPP. The conventional methods of procuring infrastructure have been compared with the new collaborative methods and this has established the reasons for the shift to this new way of thinking, especially as Nigeria is considered as a developing nation that is envisioned to have the potential to be among the 20 best economies in the world by year 2020; whilst also having insufficient means to needed funds for its infrastructural development.

The following gaps were observed to exist in the body of literature in this field; First, the contribution of the market (a social infrastructure with both economic and non economic values) to the GDP in Nigeria has not been captured effectively, unlike in UK here the contribution of the retail sector to the economy has been reported both in terms of the employment opportunities created and the number of large shopping malls that have been built across the country. Second, little has been reported regarding the body of literature on the transition in recent years in terms of the development of markets. In the case of the UK for how old traditional markets have developed into today's shopping malls has been documented, whereas, little is known in this regard in Nigeria. Third, there is a need to examine the application of collaborative systems elsewhere to improve our understanding of how they function in nations with more experience of such methods.

CHAPTER 3
PUBLIC PRIVATE PARTNERSHIP (PPP) AND INFRASTRUCTURE DEVELOPMENT

"The purpose of life is to collaborate for a common cause; the problem is nobody seems to know what it is"- Gerhard Gschwandtner (1942-).

3.1 Introduction

Although the need for collaboration between public and private partners towards the common goal of infrastructure development have been captured in the previous chapter in relation to Nigeria, as encapsulated in the quote above from Gerhard, it is evident that much ambiguity still exists in relation to the real meaning determining the form of collaboration required and the intended results of any collaboration. In the same vein, Li and Akintoye (2003) posit that academic and industrial participants in PPP projects still regard the concept of PPP as being very ambiguous. It is in response to this that extant literature detailing the purpose of PPP, its structure; forms and level of participation in the case of the private sector were carried out. This chapter therefore contains the report into all these aspects of PPPs and also reports some impediments to the application of PPPs that are evident globally, and particularly in the case of Nigeria.

3.2 Nature of Public-Private Partnership (PPPs) projects.

Involvement of private sector in procuring public infrastructure takes different forms and varies between countries. In fact, several efforts have been made by governments both in developed and developing nations to increase private sector participation in infrastructure development. For instance, in the United Kingdom (UK) after the retirement of the so-called Ryrie Rules in 1989, the Treasury promoted private finance as an additional source of finance, and the private finance initiative (PFI) was launched in 1992 by the Conservative government, which was later revamped as PPPs by the Labour government in 1998 (Cartlidge, 2010). The main aim of the private finance initiative PFI/PPP is to bring the private sector's finance, management skills, and expertise to the provision of public sector facilities and services (Akintoye *et al.*, 1998, Katz and Smith, 2003). The level of involvement of the private sector, or the nature of the responsibilities placed on the private sector in any such arrangement defines the nomenclature given to the system, thus making it difficult to produce a single definition of the PPP arrangement.

According to Li and Akintoye (2003), several academic researchers and industrial practitioners have defined PPPs as existing in different forms, while some feel that they are just an extension of privatisation; others argue that PPP is different from outright privatisation initiatives. Notable amongst these is the work of Middleton (2000) who described PPP as the successor to privatisation. Others, such as Moore and Pierre (1988); Faulkner (1997); and Collin (1998) claim that PPPs should be regarded as a viable alternative to privatisation and socialisation, because they provide the opportunity to alter the institutional milieu without the consequent loss of municipal influence. It is imperative therefore to look at different ideas and the positions of other researchers and industrial practitioners regarding the definition of PPPs.

Looking at the position of the UK government, according to HM Treasury (2000), PPPs bring the public and private sectors together in long-term partnerships for mutual benefit. In this arrangement, the private sector partner takes on the responsibility of providing a public service, including maintaining, enhancing or constructing the necessary infrastructure or facility, while the public sector partner specifies the type and quality of the service desired (Chinyio and Gameson, 2009). The Canadian council for Public Private Partnership (CCPPP) (1998) defines PPP as "*a co-operative venture between the public and private sectors, built on the expertise of each partner that best meets clearly defined public needs through the appropriate allocation of resources, risks and rewards"*.

The National Council for PPP in the United State of America (NCPPP), according to Norment (2000), defines PPP as a "*contractual arrangement between a public sector agency and a for-profit private sector concerns whereby resources and risks are shared for the purpose of delivery of a public service or development of public infrastructure*" while the European Investment bank (EIB, 2005), defines PPPs as "*risk sharing investments in the provision of public goods and services, seen by government as a means to launch investment programmes, which would not have been possible within the available public-sector budget within reasonable time"*. To Deloitte Research (2006), PPP, is simply a contractual agreement formed between a government agency and a private sector entity that allows for greater private sector participation in the delivery of public infrastructure projects.

Moreover, Akintoye (2006) describes PPPs as '*a contractual agreement of shared ownership between a public agency and a private company, whereby they pool resources together and share risks and rewards, to create efficiency in the production*

and provision of public or private goods'. See also Li and Akintoye (2003) for the opinion of other researchers regarding the definition of PPPs (researchers such as Bennett and Krebs, 1991; Collin, 1998; Peter, 1998; Sindane, 2000; and Spiller, 2000). Based on all the definitions of PPPs, it can be seen that although there are some discrepancies, they all share some similarities, which Peter (1998) has summed up as being the five major characteristics of PPPs. These characteristics are as follows;

(i) Involvement of two or more actors (at least one from the public and another from the private sector).

(ii) There is an absence of a principal-agency relationship but each party is a principal. This implies that each participant is capable of bargaining on its own behalf, rather than having to refer back to other sources of authority, thus all of these can be seen as principals.

(iii) Establishment of an enduring and stable relationship among actors. This implies that the parties are entering into a long-term relationship.

(iv) There is a transfer of resources from both parties (resources such as material, authority and other symbolic values (Tiong, 1992, and Bennett and Krebs, 1991). Meaning that no matter how small, each participant brings something to the partnership.

(v) There is some shared responsibility for outcomes or activities. This view according to Li and Akintoye (2003) is closely related to the analysis by Grant (1996) who suggested that ideas of shared authority and responsibility, joint investment, sharing liability/risk taking and mutual benefit are at the core of a partnership.

In 2001 Akintoye *et al.* corroborated the view of Peter (1998) above; asserting that part of the objective of PFI is to attract private sector funds, resources, management, skills, expertise and innovation to the provision of public sector infrastructure and services. They suggest that a fundamental requirement of PFI procurement is that appropriate risks are transferred to the private sector. They further argue that although, the aim of PFI is to transfer risks to the private sector, the ideal solution is to allocate risks optimally, meaning the party best situated to cope with each risk is assigned it.

In Nigeria, the National Policy on PPPs (NPPPP, 2009) prescribes three main features of PPPs to include the following: that (i) the contractual arrangement between the public and private sector in PPP combines the design, construction, or rehabilitation of public infrastructure with its maintenance, and sometimes with the delivery of the service

directly to the private contractor. This in turn provides an incentive to minimise the whole life costs of the infrastructure service; (ii) the contract requirements in PPPs are defined as outputs and service standards to be met, rather than inputs. In this circumstance, contractors are given freedom to propose their own designs and construction methods. This implies that the private contractor can then introduce some innovative ideas supporting its approach; and (iii) payments to the private contractor (or revenues from user charges in the case of concession) are linked to meeting specific performance standards. This also gives public authorities the ability to enforce the contract's effectiveness and provide private contractors with a strong incentive to perform. These features of PPP, according the NPPPP, can also be found in a performance based contract or in a full service concession, where the contractor will be repaid by user charges in accordance with other BOT contract models.

3.3 Types/Models of PPP.

Having looked at various definitions of PPPs in existing literature, it is important to understand the nature or features of contractual arrangements between the public and the private sector in any PPP project. Mustafa (1999) argued that since the stage was set for PFI in the eighties in the UK, different forms of procurement, such as outsourcing, privatisation, BOT and many other models have been developed. The name given to each model or form is a product of the degree of government control and private sector involvement (Gentry and Fernandez, 1997). It is worth noting that in some countries mere involvement from the private financing sector is what makes a project a PPP. Li and Akintoye (2003) identified five types of private involvement as follows: service contracts, leasing, joint ventures, concessions and privatisation. In the UK, Cartlidge (2010) identified nine principal PPP models currently in use. These models include; the Privative Finance Initiative (PFI), Building Schools for the Future (BSF), NHS Local Improvement Finance Trust (LIFT), Frameworks, ProCure21, PRIME, Public Private partnership programme (4Ps), Leasing and Concessions and Franchises. Some of the most common PPP models as identified by the NCPPP and reported in Deloitte Research (2006) are described below (see figure 3.1 and tables 3.1 and 3.2).

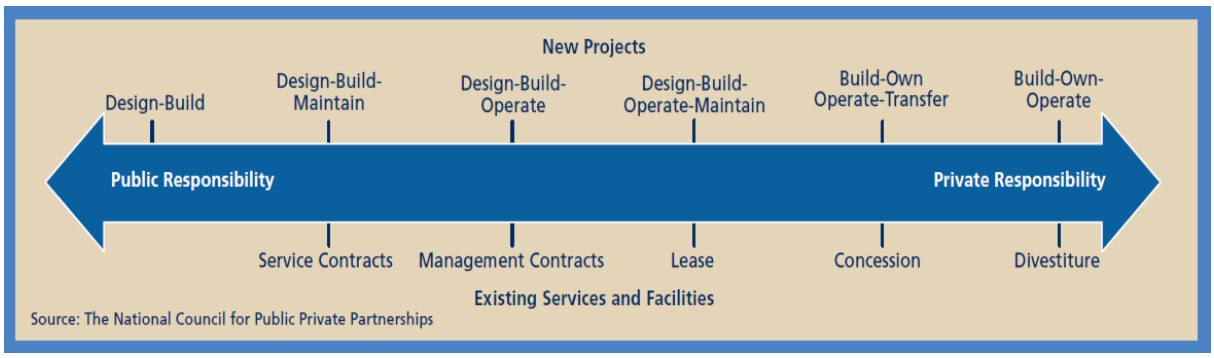

Figure 3.1: PPP models in Use.
Source: *Deloitte Research (2006): Closing the Infrastructure Gap: The Role of Public-Private Partnerships*

Table 3.1: Description of PPP models in use for new projects

Type/Model	Description of the model
Design-Build (DB)	With this model, the government contracts a private partner to design and build a facility in accordance with requirements it sets out. After completing the facility, the government assumes responsibility for operating and maintaining the facility. This method of procurement is also referred to as Build-Transfer (BT).
Design-Build-Maintain (DBM)	This model is similar to Design-Build, except that the private sector also maintains the facility. The public sector retains responsibility for operations.
Design-Build-Operate (DBO)	With this model, the private sector designs and builds the facility. Once it is completed, the title for the new facility is transferred to the public sector, but the private sector operates the facility for a specified period. This procurement model is also referred to as Build-Transfer-Operate (BTO).
Design-Build-Operate-Maintain (DBOM)	This model combines the responsibilities of design-build procurements with the operations and maintenance of a facility for a specified period by a private sector partner. At the end of that period, the operation of the facility is transferred back to the public sector. This method of procurement is also referred to as Build-Operate-Transfer (BOT).
Build-Own-Operate-Transfer (BOOT)	The government grants a franchise to a private partner to finance, design, build and operate a facility over a specific period of time. Ownership of the facility is transferred back to the public sector at the end of that period.
Build-Own-Operate (BOO)	The government grants the right to finance, design, build, operate and maintain a project to a private entity, which then retains ownership of the project. The private entity is not required to transfer the facility back to the government.
Design-Build-Finance-Operate/Maintain (DBFO,	Under this model, the private sector designs, builds, finances, operates and/or maintains a new facility under a long-term lease. At the end of the

DBFM or DBFO/M)	lease term, the facility is transferred to the public sector. In some countries, DBFO/M covers both BOO and BOOT.

Source: *Deloitte Research (2006): Closing the Infrastructure Gap: The Role of Public-Private Partnerships*

Table 3.2: Description of PPP models in use for existing services and facilities in addition to new ones

Type/Model	Description of the model
Service Contract	The government contracts with a private entity to provide services that the government previously performed.
Management Contract	A management contract differs from a service contract in that the private entity is responsible for all aspects of operations and maintenance of the facility under contract.
Lease	The government grants a private entity a leasehold interest in an asset. The private partner operates and maintains the asset in accordance with the terms of the lease.
Concession	The government grants a private entity the exclusive rights to provide operate and maintain an asset over a long period of time in accordance with performance requirements set forth by the government. The public sector retains ownership of the original asset, while the private operator retains ownership over any improvements made during the concession period.
Divestiture	The government transfers an asset, either in part or in full, to the private sector. Generally the government will include certain conditions with the sale of the asset to ensure that improvements are made and citizens continue to be served.

Source: *Deloitte Research (2006): Closing the Infrastructure Gap: The Role of Public-Private Partnerships*

Other new and innovative PPP infrastructure delivery models have been developed in recent years to address the various challenges posed to public-private partnerships in specific situations and sectors. Some of these new models are discussed below:

- ***Alliancing*:** Under this model, the public and private sector agree to jointly design, develop, and finance the project. In some cases they also work together to build, maintain, and operate the facility.
- ***Bundling*:** This involves contracting with a single partner to provide several small-scale PPP projects in order to reduce the length of the procurement process as well as transaction costs.

- ***Competitive Partnership*:** Several private partners are selected, in competition with each other, to deliver different aspects of a project. The contract allows the public sector to reallocate projects among partners at a later date, dependant on performance. The public partner can also use the cost and quality of the other partners' output as a benchmark for all partners.
- ***Incremental Partnership.*** The public sector contracts with a private partner, in which certain elements of the work can be stopped, if deemed unproductive. The public sector can commission work incrementally, and it reserves the right to use alternative partners where suitable.
- ***Integrator.*** The public sector appoints a private sector partner, the integrator, to manage the project development. The integrator arranges the necessary delivery functions and is rewarded according to overall project outcomes wherever possible, with penalties for lateness, cost overruns, poor quality, and so on. The integrator has a less direct role in service provision and in some cases is barred from being involved in direct delivery. In other cases, the integrator is appointed to carry out the first phase of the work, or specified works, but is then barred from carrying out subsequent phases of work to remove the potential for a conflict of interest between achieving best values for the public sector and maximising private returns through the supply chain.
- ***Joint Venture.*** A joint venture company is set up in which a majority of that company is owned by the private sector partner. The public sector selects a strategic partner through a competitive process that includes a bid to carry out the first phase of work. The typical contract is then over 20 years. Subsequent phases are commissioned by the public sector partner, but carried out by the strategic partner, using the first phase of work as a benchmark to determine the appropriacy of future costs.

3.4. Structure and Process of PPP contracts

The process leading to the PPP/PFI contract is long-winded (Chinyio and Gameson, 2009) consisting of several stages and varying parties/stakeholders depending on the nature of the service to be delivered or on the level of authority the public sector wants to exercise in terms of the agreement and the private economic scale. Deloitte Research (2006) divided sequential activities under PPP arrangements under three main headings as follows: (i) policy and planning phase, (ii) transaction phase, and (iii) construction and concession phase, each comprising of 19 different activities. In another study by

Carrillo *et al.*. (2006) as reported by Chinyio and Gameson, (2009), PFI projects were found to consist of 13 stages including the following: (i) needs assessment, (ii) strategic outline case, (iii) outline business case, (iv) Official Journal of European Communities (OJEC) advertisement, (v) Pre-qualification questionnaire, (vi) Preliminaries invitation to negotiate, (vii) Final invitation to negotiate, (viii) Final offer, (ix) Preferred bidder/final business case, (x) Financial close, (xi) Construction, (xii) Operation and maintenance, and (xiii) Hand back.

Furthermore, Mustafa (1999) asserts that in PFI, there is both a design aspect and a consequent construction contract. There is also the operation and maintenance, and the facilities management contract. Mellish (200) suggests the addition of environmental contracts that would require other private bodies to undertake environmental impact assessments for any proposed project. Hardcastle and Boothroyd (2003) argue that when other dynamics of PFI such as the socio-political dynamic are considered, the structure and process of PPP becomes more complex. They presented a typical set-up of a PFI scheme as shown in figure 3.2.

A cursory look at figure 3.2 shows different key players in PPP projects. These include the client, sponsors, constructors, facilities managers and financiers. In the region of four different contracts/agreements exist among these varying stakeholders. For instance, (i) there is a shareholders' agreement between the different sponsors and the client, (ii) between SPV and the constructors, there is construction agreement, (iii) SPV also enters into an agreement with facilities managers for the operation and maintenance of the facility and (iv) in a complex project, where it might be difficult for a single contractor to handle everything, the contractor may enter into a consortium like arrangement with additional contractors.

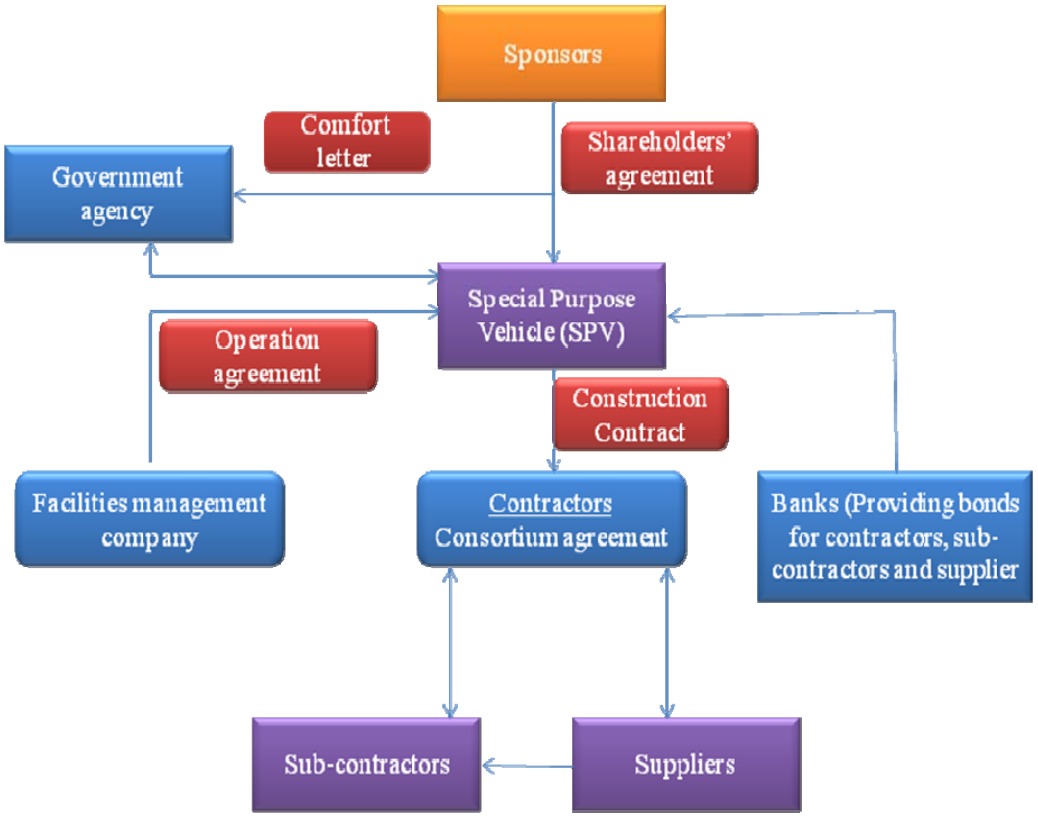

Figure 3.2 Typical set-up of PFI scheme

(source: Beenhakker, 1997, Adapted from Hardcastle and Boothroyd, (2003)

It must be emphasised here that before signing or awarding a concession contract, governments need to evaluate existing legal systems to ensure that the enabling legislation puts the appropriate corporate and commercial laws in place to support private investment. Moreover, in instances where the existing legal framework is deficient in this direction, the public sector needs to establish a necessary legislative and regulatory framework to support the workings of a PPP program. Chinyio and Gameson (2009) also suggest that before a PFI project is approved, the public sector client must prepare a public sector comparator (PSC) to show the advantages of PFI/PPP. They further argue that the client can also use PSC analysis to test whether another form of procurement will offer better value for money.

3.5 PPP in Nigeria.

PPP applications in Nigeria are becoming increasingly popular for both new and old facilities. The most commonly used approach to PPPs in Nigeria is Joint Venture (JV) and BOT approaches (Dada *et al.*, 2006). Ibrahim *et al.* (2006) also corroborates the popularity of BOT and JV models, particularly for the provision of housing and office

accommodation, civil engineering works, markets and utilities in Nigeria. There has been a recent surge in use of PPPs in public infrastructure construction in Nigeria (Oghifo, 2009). For example, the Tinapa Calabar, Africa's Premier Business and Leisure Resort, was commissioned on the 2nd of April 2007, the Lagos Domestic Airport (MM2), Lekki-Epe Expressway also in Lagos and the ClinoRiv Hospital in River State to mention a few.

In order to establish a proper legal and regulatory environment to attract private sector involvement and also to provide further guidance, the Nigerian government introduced the Infrastructure Concession and Regulatory Commission (ICRC) Act 2005 called (ICRC Act). The ICRC Act establishes the ICRC Commission, which was inaugurated in 2008. The Act stipulates the function of the commission as follows: (i) to take custody of every concession agreement made under the ICRC Act and monitor compliance with the terms and conditions of such agreement; (ii) ensure efficient execution of any concession agreement or contract entered into by the government; (iii) ensure compliance with the Act; and (iv) perform such other duties as may be directed by the President. The commission was also charged with the responsibility of developing guidelines, policies and procurement process for PPP in Nigeria. In collaboration with the States, the commission was to promote an orderly and harmonised framework for the development of Nigeria's infrastructure and to accelerate the development of a market for PPP projects.

Moreover, to support the Commission two Centres have been established. A PPP Resource Centre (PRC) and a Contract Compliance Centre (CCC). Some additional legislation was also put in place to ensure the smooth execution of PPP projects in Nigeria include the following: (a) the Public Procurement Act 2007 (Procurement Act); (b) the Bureau of Public Enterprises (BPE) (Privatisation and Commercialisation Act 1999; (c) the Debt Management Office (DMO) Act 2003; (d) The Fiscal Responsibility Act 2007, The National Planning Commission Act 2007. To further remove state monopoly over the provision of facilities and service delivery, other industry-specific Bills were drafted in the country. Among these are the Inland Waterways Bill, Ports and Harbour Reform Bill, Railway Bill, Federal Roads authority Bill, National Roads Fund Bill, Federal Competition and Consumer Protection Bill. It is envisaged that when all these Bills are passed into law, they will help to provide an enabling environment for private participation in Nigeria (WB, 2011).

In line with the Federal Government of Nigeria's (FGN) drive towards private participation in infrastructure development, many States in the country are now partnered with private sector investors, with the primary aim of accelerating the delivery of economic and social infrastructure to citizens. To achieve this, it is necessary to establish a similar commission/body to the ICRC throughout the respective states, to act as a liaison between the private sector and MDAs (Ministries, Departments and Agencies). The purpose being to guarantee that the State government enters into partnerships with private investors and developers across a range of sectors, to deliver best value-for-money (VFM). In most cases, the PPP Office works closely with these MDAs and reports to the Office of the Executive Governor of the State via the Executive Council (EXCO), the approving authority for all procurement projects in the state.

For instance, the Lagos State Government established the Lagos State Public-Private Partnership (PPP) Office in December 2008. The PPP Office operates as a "one-stop shop" that provides necessary information and advice to prospective investors in a bid to ensure efficient project implementation in accordance with the legal and regulatory framework that governs it (see official web site for list of projects commissioned www.lagosstateppp.gov.ng).

Another promoter of the PPP project delivery system in Nigeria is the Abuja Infrastructure and Property Development Corporation (AIPDC). The AIPDC is the private sector arm of the Federal Capital Development Authority (FCDA) in the Federal Capital Territory (FCT), Abuja. AIPDC has a subsidiary company called Abuja Markets Management Limited (AMML) which was incorporated in 2004 with the mandate to upgrade the FCT markets by providing modern facilities and management services. This body is a corporate member of the International Facility Management Association (IFMA) with its headquarters in Houston Texas USA. The AIPDC's PPP projects are at various stages of the procurement process and are estimated to cost over 30 billion US Dollars (Ibrahim *et al.*., 2006). This situation mirrors that in most of the States of the Federation, as can be seen through a partnership between States and their private partners. For instance, Ondo State in a partnership with the private sector has become involved in reconstructing Erekesan Market in Akure; the Kwara State government has undertaken similar activity in the Ultra Modern market in the State as well as in many other States, including Edo State and Osun State, which are at different stages of

negotiation with private partners, seeking to upgrade some of the old markets in their states.

In Nigeria, the 13 systematic processes or stages in the PPP arrangement are as identified by Carrillo *et al.*. (2006); these can be said to have been subsumed under four phases as follows;

(i) Project development phase;
(ii) Procurement phase;
(iii) Implementation phase;
(iv) Maturity phase.

The overriding principle with any project the government embarks upon is that it must seek to increase the welfare of the people or strive for the economic benefit of the country. Moreover, because it is only through competition that the market price for procuring authority's specific requirements is determined in the country, and this is usually achieved by inviting sealed bids from number of different bidders, the ICRC commission has issued a manual setting out the principles which all public procurement processes in Nigeria should adhere to. For PPP projects, major principles include: Value for money (VFM), Transparency, Fairness, Efficiency, and Accountability and Governance.

3.6 Upside and Downside of Public Private Partnership

Forming public-private partnerships to assume functions that were formerly public sector responsibilities has potential benefits as well demerits for both citizens and governments. PPPs can increase competition and efficiency in service provision, expand coverage, and reduce delivery costs. PPPs allow optimal overall risk allocation between the public and private sectors, facilitating the distribution of risk to those organizations that can most effectively manage it (Dennis, 2002). Price (2000) reported that the construction period under PPP/PFI is shorter with 80% of construction completions under PPP occurring either on time or ahead of time, which according to Chinyio and Gameson (2009), is better than that which occurs with most other forms of procurement.

Another benefit is the issue of cost saving; Grubb (1998) argues that the whole-life cycle cost incurred by a scheme procured by PFI is generally cheaper than that procured by traditional means. This assertion was corroborated by the British Columbia Partnership (2003) who remarked that by taking advantage of private sector innovation, experience and flexibility PPP/PFI schemes can deliver services more cost effectively

than traditional approaches. Despite all these benefits, PPP projects also have their own demerits which include: (a) high transaction costs; (b) unusual alliances; (c) quantification of risks; (d) unusually high profits; (e) justification of PFI; (f) inadequate prior knowledge of PPP; (g) demanding negotiations; and (h) bland products (Chinyio and Gameson, 2009). Zou, Wang and Fang (2008) summarised the benefits and limitations of PPP projects as shown in table 3.3.

Table 3.3: Upsides and Downsides of PPP projects.

Upsides of PPPs	**Downsides of PPPs**
Reducing the cost to implement the project (Li and Akintoye, 2003).	Being negotiated for a longer term (30 years or more), PPP planning is more complicated (Transport Quebec, 2006)/
A favoured form of financial engineering or off-balance sheet financing which have been devised to avoid treating financing arrangements as debt (Centennial Consultancy, 2005)/	The up-front cost of PPP projects is much greater than the preparation and negotiation costs of conventional procurement methods (ECI, 2003)/
Potentially best practice of risk sharing to improve productivity and performance (Li and Akintoye, 2003).	May "lock in" governments to existing models of service delivery and lead to a loss of public sector skills (Centennial Consultancy, 2005).
Transferring risks from government to competent private partners (Grimsey and Lewis, 2004)	Complexity of contractual structure, which in turn results in longer negotiation periods (ECI, 2003).
Superior value-for-money (regarded as the sole reason for adopting a PPP type of project procurement method by the New South Wales Treasury Office 2002).	Although through PPP Governments try to remove the capital expenditure for the assets from their capital accounts, the possibility of expenditure realisation in the capital accounts, due to the Government liability in case of partnership failure should not be disregarded.
Shorter construction period (Department of Transport and Regional Service, 2005).	Lead to a loss of services to the community (Centennial Consultancy, 2005).
Attracting larger, potentially more competent and productive bidders to the project (Li and Akintoye, 2003).	Distort spending and urban planning priorities, since priority may be given to projects that are readily packaged as PPPs, instead of those producing greatest benefit to the community (Centennial Consultancy, 2005).
Streamlined contracts and simplified procurement (Department of Transport and Regional Services, 2005).	
Facilitation of innovation, bringing diverse interests together and enabling public authorities to cohere around common objectives (Jacobs, 1997).	

Getting away from the bureaucratic and political processes involved in publicly procured projects (Grimsey and Lewis, 2004).	
An effective manner in introducing new technologies and encouraging technology transfer (Blaiklock, 2003).	
Effective vehicle bringing about environmentally efficient buildings, resulting from the whole-of-life view of the project (Grimsey and Lewis, 2004)	
Access to skills, experience and technology of the private sector (Li and Akintoye, 2003)	

Source: Zou, *et al.*., (2008).

3.7 Private activity in infrastructure development in Nigeria.

The private sector is playing an increasingly important role in producing goods and providing services that were once considered "public" and exclusively the responsibility of governments (Li and Akintoye, 2003). Public-Private Partnerships (PPPs) and other forms of cooperation between the private sector and local and national governments are used frequently around the world to develop and expand energy and utility networks and services, extend telecommunications and transportation systems, construct and operate water, sewer, and waste treatment facilities, and provide health, education and other services (Tanninen-Ahonen, 2000; Li *et al.*, 2005; Abednego and Ogunlana, 2006; Loosemore and Ng. 2007).

In a study conducted on private sector participation in infrastructure by the World Bank in 2008, it was revealed that between 1984 and 2007, out of a total 4,100 infrastructure projects in low- and middle–income countries by developing region, 357 infrastructure projects were in Sub–Saharan Africa, amounting to a total investment of 68,716 US$ million. The infrastructures projects reported are Energy, Telecom, Transport, Water and sewerage over 46 countries. These records affirm the submission of Li and Akintoye (2003) that in the developing world, there is a strong regional concentration of PPP contracts, principally in Latin America, and followed by South Asia (see tables 3.3 and 3.4 for the breakdown).

Table 3.4: Number of Projects by Primary Sector in Sub-Saharan Africa.

Financial Closure Year	Energy	Telecom	Transport	Water and Sewerage	Total
1990	1	0	1	0	2
1991	1	0	1	1	3
1992	0	3	0	1	4
1993	3	3	3	1	10
1994	4	3	1	0	8
1995	3	10	2	1	16
1996	4	9	4	1	18
1997	6	17	5	0	28
1998	5	15	7	1	28
1999	7	13	6	5	31
2000	5	19	6	1	31
2001	7	16	2	4	29
2002	3	3	1	2	9
2003	7	9	9	1	26
2004	4	10	5	0	19
2005	12	6	21	1	40
2006	11	10	8	2	31
2007	6	14	2	2	24
Grand Total	89	160	84	24	357

(*Source: Private Participation in Infrastructure Data base World Bank Group* 2008).

Table 3.5: Investment in Projects by Primary Sector (US$ million) in Sub-Saharan Africa

Investment Year	Energy	Telecom	Transport	Water and Sewerage	Total Investment
1990	40	0	0	0	40
1991	0	0	0	0	0
1992	0	20	0	0	20
1993	0	1	31	0	31
1994	76	553	18	0	647
1995	77	677	63	0	817
1996	428	961	28	20	1,437
1997	754	1,755	469	0	2,978
1998	715	1,467	336	0	2,517
1999	585	2,846	1,087	82	4,601
2000	451	2,787	204	31	3,473
2001	713	4,050	484	3	5,251
2002	484	3,635	78	0	4,196
2003	1,297	4,715	280	9	6,301
2004	56	4,512	223	0	4,792
2005	1,359	4,918	2,460	0	8,737
2006	616	7,028	4,251	0	11,895
2007	1,192	9,484	187	121	10,984
Grand Total	8,841	49,410	10,199	266	68,716

(*Source: Private Participation in Infrastructure Data base World Bank Group* 2008).

Nigeria is a country in Sub-Saharan Africa, and the most populous nation in Africa, yet only 50 projects took place there. From tables 3.5 and 3.6 one can see that private sector investment in infrastructure development has become more prevalent throughout the country fairly recently. Between the period 1990 and 1996 the number of projects was almost nil and this continued between 1997 and 1999 with very few cases of private sector involvement. This was the pre-democracy era, when government policy had not

been liberalised sufficiently to provide benefits from interdependency. Private investment stood at approximately US$0.76 billion in 2000, growing to US$3.04 billion in 2007. By the end of 2007 cumulative expenditure by the private sector had risen to approximately US$17 billion. The major driver for such increases was the conformity of Nigeria to global trends in private participation through the establishment of an enabling environment for private participation, as discussed previously. From table 3.7 it can be observed that cumulative private investment in energy amounted to US$ 2.2 billion and in the telecommunication sector; this was in the region of US$12.3 billion (12.8% and 71.9% of total infrastructure investment respectively). Investment in the transportation sector is also equally relevant in terms of magnitude (15.3% of the total infrastructure investment).

Table 3.6: Snapshot of infrastructure projects by private investment in Nigeria

Featured Indicator, 1990-2007	**Value**
Infrastructure Sectors Reported	Energy, Telecoms, Transport
Projects reaching financial closure	50
Sector with largest investment share	Telecoms
Type of PPI with largest share in investment	Greenfield project
Projects cancelled or in distress	2 (0% of total investment)

(*Source: Private Participation in Infrastructure Data base World Bank Group* 2008).

Table 3.7: Total Investment in Projects by Primary Sector (US$ million) in Nigeria

Year of Investment	Energy	Telecom	Transport	Water and sewage	Total
1990	0	0	0	0	0
1991	0	0	0	0	0
1992	0	0	0	0	0
1993	0	0	0	0	0
1994	0	0	0	0	0
1995	0	0	0	0	0
1996	0	0	0	0	0
1997	0	22	0	0	22
1998	0	28	0	0	28
1999	0	19	0	0	19
2000	0	76	0	0	76
2001	295	971	0	0	1,266
2002	462	848	0	0	1,310
2003	34	1,674	0	0	1,708
2004	0	1,070	0	0	1,070
2005	1,129	2,312	2,355	0	5,796
2006	0	2,535	262	0	2,797
2007	280	2,761	0	0	3,041
Total	2,200	12,316	2,618	0	17,133

(*Source: Private Participation in Infrastructure Data base World Bank Group* 2008).

Table 3.8: Total Projects by primary sector and subsector (US$ million) in Nigeria

Sector	Sub-Sector	Number of Projects	Total Investment
Energy	Electricity	6	1,521
	Natural Gas	3	679
	Total Energy	9	2,200
Telecom	Telecom	18	12,316
	Total Telecom	18	12,316
Transport	Airports	1	200
	Railroads	1	6
	Seaports	21	2,412
	Total Transport	23	2,618
Total		50	17,133

(*Source: Private Participation in Infrastructure Data base World Bank Group* 2008).

However, despite the increasing participation of the private sector in the development of the country's infrastructure, in terms of the maturity of PPP markets, this is below that of other developed and developing nations worldwide. For clarity, in a study conducted by Deloitte, (2006), Nigerian PPPs were found to have not captured any of the three stages of maturity associated with the PPP market elsewhere (see figure 3.3).

The study observed that "*many governments who are even at the first stage of PPP development seem to be charging headlong into infrastructure partnerships without a deep understanding of what has worked and what hasn't in other cases—putting themselves and others at risk of repeating earlier mistakes in other jurisdictions*". The study suggested further that instead of moving into partnerships dogmatically like this, it is necessary for Nigeria to learn from those countries like the United Kingdom, the USA, Australia, Ireland, and Netherlands who have moved to the more advanced stages of PPP, as this will help them to avoid some of the mistakes that are often made in earlier stages of maturity, such as the tendency to apply a one-size-fits-all model to infrastructure projects. It is therefore concluded to be imperative for Nigeria, which is not on the curve presently, to take some cue from those countries at different levels of the PPP maturity Curve. This type of learning process will allow the country to move up the PPP maturity curve more rapidly and leapfrog to more advanced stages.

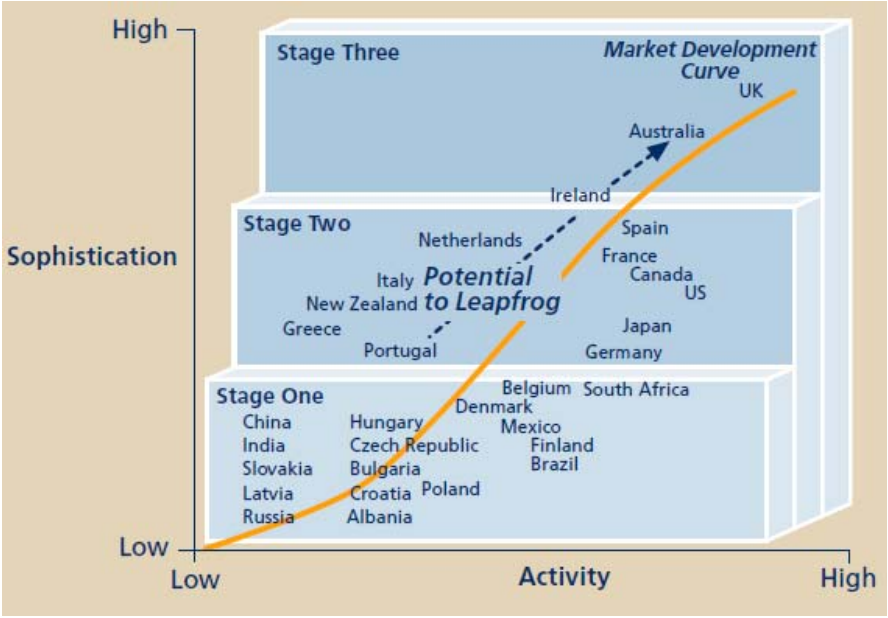

Figure 3.3 PPP Market Maturity Curve

Source: *Deloitte Research (2006): Closing the Infrastructure Gap: The Role of Public-Private Partnerships*

3.8 Summary and literature gap

In this chapter, existing literatures have been reviewed in relation to the nature of PPPs and the different PPP models in use in the construction industry. It has been revealed that while there is no standardised definition of PPP at present; those definitions offered by both academic and industrial practitioners, tend to have several things in common. All of them are dependent on the level of public control involved in the arrangement as well as the level of involvement from the private sector. Of the different types of PPPs known to the industry, JV and BOT are seen as the commonest models in use in Nigeria's construction industry. The use of these arrangements, have their own merits and demerits and all these have been covered here. Moreover, the level of private involvement in infrastructure development in Nigeria has been reviewed, revealing that much has been done and remains still to be done in areas like energy, telecommunications, and the transportation sector of the economy. This will also involve transitions into other sectors like retail, real estate and education. It was established that the PPP market in Nigeria is yet to reach any level of maturity. There is therefore a need to look at the successes and failures of PPP projects in other countries so as to help shape the understanding of key stakeholders involved in PPP projects. This is the reason for examining the performance of some early PPP projects, as described in Deloitte Research (2006).

CHAPTER 4

PERFORMANCE EVALUATION OF PUBLIC PRIVATE PARTNERSHIP PROJECTS

"*Measurement is the first step that leads to control and eventually to improvement. If you can't measure something, you can't understand it. If you can't understand it, you can't control it. If you can't control it, you can't improve it.*"

- H. James Harrington

4.1 Introduction

A project is "a temporary endeavour undertaken to create a unique product, service, or result" (PMBOK, 2004). Kloppenborg (2009) stated that a project requires an organised set of work efforts that are planned to a level of detail that can be progressively elaborated upon as more information is discovered. According to PMI (2000) each project typically involves a unique combination of stakeholders (i.e. persons or organisations that are actively involved in the project, or whose interest may be positively or negatively affected by the project). All projects, either small or large go through predictable stages known as a project cycle. A project cycle, according to Kloppenborg (2009), is a collection of general sequential project phases whose names and numbers are determined by the control needs of the organisation, or organisations involved in the management of the project. Hence, an organisation's control needs are to be assured that the work of the project is proceeding in a satisfactory manner and that the results are likely to serve its customer's/stakeholder's intended purpose. The Project Customer is the individual or organisation that will use the project, product or service or result (Kloppenborg and Warren, 2002). Customers can be internal to the organisation (i.e. they are part of the company that is performing the project) or external to the organisation (they do not work for that company).

All projects, regardless of size, complexity, or application, need to be planned and managed. However, while the level of detail and specific methods may vary widely, all project management needs to follow generally accepted methods if projects are to be successful, and if project management is to be a success. The first thing a project manager (PM) needs to do is to understand the project's objectives from the perspective of all project stakeholders, and the PM can only achieve this by first establishing what

the project's general success criteria are and by understanding the specific priorities of the most important project stakeholders. Therefore, in this chapter, an effort is made to look at what project success is, especially as it relates to PPP projects; in particular what factors affect the success of projects procured using PPP arrangements negatively, and how might these be overcome. The chapter then concludes by summarising the judgments of other researchers regarding these issues and by identifying the gap in the literature.

4.2 Public Private Partnership project success and success factors

Many studies have discussed what constitutes a successful project. For example Nguyen, Ogunlana and Lan, (2004) expressed the opinion that a project is acknowledged as successful when it is completed on time, within budget, and in accordance with specifications and to stakeholders' satisfaction. Crawford and Bryce (2003) suggest that project success can be evaluated from two different dimensions viz: the efficiency dimension, performing the action correctly and the effectiveness dimension, performing the right action. Takim and Akintoye (2002) used functionality, profitability to contractors, absence of claims and court proceedings and "fitness for purpose" for occupiers as measures of project success. Others such as Cooke-Davies (2002) and Chua *et al.*. (1999) have clarified that a project's success is measured against the overall objectives of that project, while project management success is measured against cost, time and quality performance.

Sanvido *et al.*. (1992) and de Witt (1988) suggested that there should be a distinction between project success (which cannot be measured until after the project is completed) and project performance (which can be measured during the life of the project). Baccarini (1999) contends that project success should be measured both in terms of product success and project management success. The implications of this is that for project management to be successful, a project manager (PM) needs to understand the objectives of the project as it relates to the client (mostly- time, cost and quality or what is termed "iron triangle" by Atkinson, 1999) and also considers others that may be affected by the project or those who may affect the project in some way.

Regardless of the perspective from which one investigated the form a successful project takes, researchers have sought to identify criteria that typically determine failure or success (see Pinto and Slevin, 1988, 1989; Maloney, 1990; Sanvido *et al.*., 1992;

Cameron and Whetten, 1983; Atkinson, 1999; Chua *et al.*. 1999; Mbugua, 2000; Cooke-Davies 2002; Takim and Akintoye, 2002; Nguyen, Ogunlana and Lan, 2004; Takim and Adnan, 2008). Kloppenborg (2009) summarises the results of current research work into measures determining project success into three broad categories, as shown in table 4.1.

Table 4.1: Project Success Measures

Meeting Agreements	Customer Success	Performing Organisation Success
Meeting technical specifications.	Meeting the customer's needs.	Increasing market share.
Not exceeding cost constraints.	Creating a result the customer can use.	Opening new technology/markets.
Not exceeding schedule constraints.	Enhancing customer satisfaction.	Achieving commercial success.

Source: *Adapted from Kloppenborg (2009) Project management a contemporary approach.*

It is evident from table 4.1 that the first criteria establishing the general success of the project is meeting the agreements made at the outset of the project in term of cost, time and quality. The second set of criteria focuses on the experiences of the project's customers. Specifically, this relates to whether the project result actually meets the customer's needs; for example were the outcomes of the project being used by the customer, and did they enhance the customer's satisfaction? Whereas the third set of success criteria dealt with the future of the parent organisation or the performing organisation. The performing organisation here is the enterprise whose personnel are most directly involved in carrying out the work associated with the project (PMBOK, 2004). Typical measures here include market share, new markets and the commercial success of the project output. In understanding the specific priorities of the project's most important stakeholders, the project manager and team need to understand what areas the most important stakeholders would like to see improvements to and which area(s) they are willing to sacrifice to facilitate those improvements.

Aside from the efforts mentioned above in relation to construction projects in general, Toor and Ogunlana (2008 and 2009) have identified the critical success factors (CSFs) that contribute to successful delivery of large construction projects. Many other researchers have directed their efforts towards identifying CSFs in PPP projects.

Notable among them are Tiong *et al.*. (1992). Tiong (1996) identified six CSFs in winning BOT contracts, Morledge and Owen (1997) and Gupta and Narasimham (1998) provided additional CSFs for SPV to win BOT contracts. Li *et al.*. (2005) identified 19 CSFs for PPP projects in the United Kingdom and Zhang (2005) summarises CSFs for PPPs in infrastructure development in the literature under five broad headings as follows: (i) favourable investment environment, (ii) economic viability, (iii) reliable concessionaire consortium with strong technical strength, (iv) sound financial package and (v) appropriate risk allocation via reliable contractual arrangements. He further identifies 47 sub factors for success in the case of PPP projects (see table 4.2 for the breakdown of CSFs and other sub factors of success).

Furthermore, recent efforts in the area of PPP project success have elucidated the importance of effective stakeholder management. For instance, Olander and Landin (2005) have shown how failing to understand and manage external stakeholders has dramatically delayed railway infrastructure projects, and other surveys show that coping with external stakeholders is perceived as imperative to project success (Calvert, 1995).

Table 4.2 Critical Success factors and Success sub factors for PPP projects

Critical success factor	**Success sub factors**
❖ Favourable investment environment	✚ Stable political system; ✚ Favourable economic system; ✚ Adequate local financial market; ✚ Predictable currency exchange risk; ✚ Predictable and reasonable legal framework; ✚ Government support; ✚ Supportive and understanding community; ✚ The project is in the public interest; ✚ Predicable risk scenarios; ✚ The project is well suited to privatisation; and ✚ Promising economy.
❖ Economic viability	✓ Long-term demand for the products/services offered by the project; ✓ Limited competition from other projects; ✓ Sufficient profitability of the project to attract investors; ✓ Long-term cash flow that is attractive to lender; and ✓ Long-term availability of suppliers needed for normal operations.

❖ Reliable concessionaire consortium with strong technical strength	✚ Leading role by a key enterprise or entrepreneur; ✚ Effective project organization structure; ✚ Strong and capable project team; ✚ Good relationship with host government authorities; ✚ Partnering skills; ✚ Rich experience in international PPP project management; ✚ Multidisciplinary participants; ✚ Sound technical solution; ✚ Innovative technical solution; ✚ Cost-effective technical solution; ✚ Low environmental impact; and ✚ Public safety and health considerations.
❖ Sound financial package	✓ Sound financial analysis; ✓ Investment, payment, and drawdown schedules; ✓ Sources and structure of main loans and standby facilities; ✓ Stable currencies of debts and equity finance; ✓ High equity/debt ratio; ✓ Low financial charges; ✓ Fixed and low interest rate financing; ✓ Long-term debt financing that minimises refinancing risk; ✓ Abilities to deal with fluctuations in interest/exchange rates; and ✓ Appropriate toll/tariff level(s) and suitable adjustment formula.
❖ Appropriate risk allocation via reliable contractual arrangements	✚ Concession agreement; ✚ Shareholder agreement; ✚ Design and contract construct; ✚ Loan agreement; ✚ Insurance agreement; ✚ Supply agreement; ✚ Operation agreement; ✚ Off-take agreement; and ✚ Guarantees/support/comfort letters

Source: Zhang (2005) Critical Success Factors for PPP in Infrastructure Development

Moreover, Cleland (1986) affirms that understanding and managing how internal stakeholders within an organisation affect the fulfilment of that project is also

important, and that this may constitute a major challenge. Chinyio and Olomolaiye, (2010) suggest that stakeholder management enhances greater competency in terms of relational issues and can therefore minimise risks therein. In the opinion of Sutterfield *et al.* (2006) project success is intrinsically related to the adeptness of project managers in managing the interests of multiple stakeholders throughout the entire project management process. All these findings, and many others affirm the importance of stakeholders in PPP projects and the need to keep those various stakeholders satisfied if the PPP project is to be successful.

Chinyio and Olomolaiye, (2010) also detail the importance to stakeholder management of identifying and classifying stakeholders to facilitate both initial and subsequent engagement with them in a timely, planned and coordinated manner. Stakeholders can be classified as either primary or secondary, or as active or passive stakeholders. Winch, (2004) defines project stakeholders as being 'internal' or 'external' to the project. Internal stakeholders are those stakeholders that are formally members of the project coalition and, hence, usually support the project. They are often referred to as primary stakeholders (Cleland, 1998) or business actors (Cova and Salle, 2005). Such stakeholders have a formal, official, or contractual relationship with the organisation. External project stakeholders are not formal members of the project coalition, but may affect, or be affected by, the project. Such groups are often referred to as non-business stakeholders (Cova and Salle, 2005) or secondary stakeholders (Clarkson, 1995).

Managing stakeholders therefore, involves managing relationships in order to motivate them to behave in ways that support the objectives of a firm (Chinyio and Olomolaiye, 2010). Harris (2010) suggested that practical stakeholder management requires identification of the following five considerations: (i) Who are the stakeholders and what are their interests in the project? (ii) What opportunities do these interests offer the project or firm? (iii) What challenges or threats are thereby presented? (iv) What level of responsibility is appropriate in meeting stakeholder requirements? And (v) what are the necessary strategies demanded, e.g. direct dealings, aggressive attitudes or accommodating a combination of different courses of action. An effective project manager (PM) can understand all the aforementioned considerations through applying a proper stakeholder analysis, via effective communication with stakeholders and applying appropriate strategies and tactics.

Manowong and Ogunlana (2010) have identified stakeholders principally through the stakeholder matrix created during the project's initiation phase, the PM should utilise

the stakeholder map attained to better understand the relationships between various stakeholders regarding specific problems. The next issue in this regard, is for the PM to employ the right strategies for managing and dealing with the stakeholders identified. Weiss (2003) proposed the following tactics for coping with stakeholders: (i) approach each stakeholder directly or indirectly; (ii) do nothing, monitor, take offensive or defensive with certain stakeholders; (iii) determine whether to accommodate, negotiate, manipulate, resist, avoid or wait, and see with specific stakeholders; and (iv) apply a combination of strategies.

Despite awareness of all these aforementioned success factors, the failure of many PPP projects has been reported in the literature. It is imperative then to know what actually contributed to these failures, to inform understanding of what to be aware of when instituting any PPP arrangement in order to achieve desired results. Thus, we will proceed to examine the factors that affect the success of PPP projects in the construction industry.

4.3 Factors affecting the success of PPP projects

It can easily be argued that the absences of those CSFs and their respective success related sub factors, as identified in table 4.2, will definitely lead to the failure of PPP projects. It is evident that projects will succeed or fail due to a number of similar reasons. Nevertheless, many authors have probed and investigated in specific terms the factors that constitute impediments to the successful implementation of PPPs (see Wang *et al.*., 2000, Nijkamp *et al.*., 2002; Scharle, 2002; Jefferies *et al.*., 2002, Lane *et al.*., 2003; Parker and Hartley, 2003; Robinson *et al.*., 2004; Jamali, 2004; Li *et al.*., 2005; Grimsey and Lewis, 2005). Zhang (2005) quoting from Asian Business (1996), listed some of the reasons why partnered projects failed as follows: (a) wide gaps between public and private sector expectations; (b) lack of clear government objectives and commitment; (c) complex decision making; (d) poorly defined sector policies; (e) inadequate legal/ regulatory frameworks; (f) poor risk management; (g) low credibility of government policies; (h) inadequate domestic capital markets; (i) lack of mechanisms to attract long-term finance from private sources at affordable rates; (j) poor transparency; and (k) lack of competition. Trafford and Proctor (2006) suggest that lack of good communication, openness, poor planning, a central ethos and lack of direction stand as impediments to a successful partnership venture. They then proposed a

theoretical framework model called "the COPED model" (Communication, Openness, Planning, Ethos and Direction). This set of criteria agree broadly with the suggestions of Samii *et al.*. (2002), which highlight the key formative requirements of effective PPPs to include (i) resource dependency, (ii) commitment symmetry, (iii) common goal symmetry, (iv) intensive communication, (v) alignment of cooperation learning capability and (vi) converging working cultures.

In the same vein, Abdel Aziz (2007) reported the difficulties in terms of implementation of PPPs in the US. According to him, one of the two main impediments identified in the USDOT, (2004) is local opposition, i.e. lack of local community support. He also cited opposition from transportation program administrators/staff as part of the impediment affecting another FHwA (2005b) report covering PPP implementation in seven states (Abdel Aziz, 2007). These streams of literature generally point towards the fact that PPP arrangements are high-risk strategies. For instance when one investigates all the impediments, it is apparent that they can be foreseen, but it is not easy to determine the likelihood that they will arise. Having identified the CSFs and likely impediments to PPP arrangements, the next section of this chapter will observe how PPP projects have performed to date so as to weigh the benefits of success against the risks involved.

4.4 Performance of PPP Schemes across the Globe

The importance of performance evaluation practices for the decision-making processes of organisations generally have been well documented in the field of management accounting Haktanir and Harris (2005). Nonetheless, performance evaluation remains a contextual phenomenon without a universal definition. Performance on one hand can be said to be synonymous with the realisation or achievement of a stated objective. While evaluation on the other hand, according to the Cambridge Dictionary online is a process of making judgements about the value or importance of something. Bourguignon (2004) proposes a definition of performance evaluation in an organisation "*as a process by which an authorised person formulates a judgement- producing various consequences – on the value of some attributes of another person, by the way of appropriate instrumentation*". The value of the definition, according to Bourguignon, concerns social utility and the pre-determined code. Therefore, we can describe performance evaluation in this context as a process by which both the public and private participants,

as well as the end users of PPP projects formulate a judgement on the value of the product of the PPP arrangement that can be based on pre-defined goals and objectives.

Achieving best value for public services and products is the ultimate objective of PPPs despite the difference of stakeholders in regards to performance objectives (Zhang, 2005). In PPPs, best value emphasises quality, efficiency/effectiveness, value-for-money (VfM) and performance standards (Akintoye *et al*., 2003). According to goal-setting theory (Locke and Latham, 1990), the level of satisfaction can be established by gauging the discrepancies between the goal levels (the level that is set) and the performance level (the level that is achieved). Aside from the general project, success criteria or objectives, as discussed in the previous section, added to this are some pre-evaluation measures/criteria. The HM Treasury (1997) asserts that contractual arrangements that follow the PFI/PPP model must also demonstrate that it is likely to deliver VFM and be affordable. This then implies that for PPP projects to be said to have performed well, the end product must not only be delivered on time, to cost and of the desired quality, it needs also to demonstrate that the final product has offered VFM and is presented to the end user at an affordable price.

According to National Audit Office NAO (2009), in the UK, one of the core areas of debate around the use of the Private Finance Initiative (PFI)/PPP concerns the performance of PPP construction projects, and in particular whether they deliver in terms of the expected time frame, price and quality. While the world of PFI/PPP has attracted an almost religious fervour with passionate advocates it is also characterised by criticism from vociferous detractors who believe the system is not delivering the promised benefits.

Due to UK's experience of almost two decades in the development of a PPP procurement framework, much study has been commission to evaluate the performance of PPP projects, either to justify the involvement of the government or as a reaction to the criticism. For example, in 2002, research was undertaken by Mott MacDonald which measured the relative degree of optimism bias associated with traditional procurement. The result of the study indicated that UK PPP projects had relatively neutral 'optimism bias', whereas the results for traditionally procured projects showed significant optimism bias (Raisbeck, Duffield and Xu, 2010). Moreover, Shaoul (2009) reviewed the outcomes of PPP projects in the UK in terms of the advantages claimed, focusing in particular on the financial cost, the cost of risk transfer, and VFM. Shaoul noted that in all of the first 12 operational Hospitals in England as of 2001 (representing

a total capital cost of about £1.2bn, with a combined annual cost of PFI payment of about £260m in 2005, and a total payment of about £6bn over the 30 year life of the project), found that in a number of cases, the actual payments to the private sector turned out to be considerably higher than those originally estimated by the Department of Health. He asserted that while the average increase was 20%, it was as much as 71% for North Durham, 60% for South Manchester and 53% for Bromley (Shaoul *et al.*., 2007).

In the same vein, Asenova and Beck (2009) reported that in implementing PFI projects, there exist myriad problems of accountability and transparency in relation to public procurement. They quoted fundamental objections to this new form of governance, which they argue relate to wider concerns about declining democratic oversights and public interest. One of these reports is a sponsored report on the Cumberland Infirmary, Carlisle, where UNISON, the UK's largest labour union, was questioning the level of financial diligence and the accountability of the respective NHS trust. The report states in part as follows: " *We conclude that the deal does not give the taxpayer value for money, we have shown that the interest rate assumption at the heart of the economic appraisal has been deliberately set to favour the private sector, and that after only a minor adjustment the alleged advantages of the PFI option disappear. However, in Carlisle's case, political manipulation alone was insufficient to make the economic case. Only major errors in the Trust's economic calculations could do that. If these were rectified, the PFI option would be seen to be a bad economic option, more costly than the public alternative by £11 million. On a proper economic appraisal, Carlisle's PFI should have never left the drawing board*" (UNISON, 1999).

The situation is no different in Germany, though the concept is reported to be still very new there, Alfen and Frank-Jungbecker (2009) reported that the first PPP road project i.e. the Tunnel Warnowquerung in the city of Rostock recorded a loss in two-digit millions due to an enormous gap between planned and existing traffic volume, which later led to an extension of the concession period from 20 years to 50 years. Shaoul (2009) concluded that these extra ordinary results are not solely British or German phenomena, as evidence from the hospital sector in Australia and privately financed roads in Spain speak volumes also. In line with this assertion, failure of two BOT transportation projects has been reported by Ogunlana (1997). Abdul-Aziz (2001) also reported on the failure of the privatised National Sewage project in Malaysia. These failures occurred due to the short history and a lack of PPP experience and expertise

(Ogunlana, 1997, and Abdul-Aziz, 2001). Ogunlana and Abednego (2009) also reported on the performance of the Yen Lenh Bridge; a BOT project in Vietnam. They found that the project performed badly in terms of fairness to all stakeholders. In the area of transparency, it was observed that there was a lack of understanding between the project's stakeholders due to ineffective information management practice and improper communication among the parties. In the area of accountability, effectiveness and sustainability, the project was considered to be substandard as the occurrences in the project actually discouraged potential private entities from participating in future infrastructure development.

In recent years, the UK government has attempted to counteract these criticisms by conducting research (NAO, 2003, Partnership UK, 2006 and NAO, 2009). The 2009 report by NAO aimed to provide an update to expand on the information published in their 2003 report PFI: Construction Performance. The evidence for the report was based on two surveys conducted in 2008 into public sector construction projects with a total capital cost of over £20 million, completed between 2003 and 2008 in England. The report also draws on secondary data from the Office of Government Commerce (OGC) on public sector construction projects. 69% of the 114 PPP projects reported were delivered according to the contracted timetable in 2008, and 65% were delivered at the contracted price. It was reported that some of the factors that contributed to good performance at the time included the nature of the PFI contract with its emphasis on clear output specifications and deferment of payment until completion; and good project management, such as clear communication between partners to contract. It was also reported that nearly half, 43% precisely, of delayed projects also incurred price increases and that the major cause of this was linked to private sector risk.

However, the improvements experienced in 2008 compared to 2003 can be traced to a set of initiatives introduced by the UK government to improve the operation of PFI. Carrillo *et al.*., (2008) identified these initiatives to include (i) improving public sector procurement skills by establishing specialised private finance units; for example, departments like the Department of Health, HM Prison Service and the Highways Authority now have specialised private finance units; (ii) setting up of bodies such as Partnerships UK and the Public Private partnerships Program (4Ps) to provide advice, support and training to the public sector to strengthen its function; (iii) Introduction of Gateway reviews by the OGC to allow an independent review of the organisational readiness of public bodies to move their projects forward at predefined critical stages in

the procurement process; (iv) advancement of the concept of high quality design on public procurement by the Commission for Architectural and the Built Environment (CABE); (v) introduction of standard contracts and other supporting documentation to reduce the length and cost of negotiation periods, ensure consistency in the approach to risk transfer and management; and (vi) introduction of new schemes targeted at special markets, for example, the NHS LIFT (Local Improvement Finance Trust) to provide community-based health facilities, and Building Schools for the Future (BSF), a program for rebuilding and renewing all secondary schools.

Carrillo *et al.*., (2008) concluded that despite these measures, problems still exist in a number of areas. Reasons advanced for these are: (i) the lengthy bidding period; (ii) continuing lack of sufficient PFI expertise within the public sector; (iii) lack of knowledge transfer between projects, and (iv) the public being unconvinced about the value for money provided by the private sector. Thus, it is evident that while many PPP projects have failed to perform to desirable standard, others can be said to have been successful or to have performed very well. Moreover, it is also obvious that those PPP projects that have failed have done so as a result of one problem or another stemming from some of the occurrences of unforeseen events that have impaired their performance. All these aforementioned impediments, otherwise known as risk factors then required concerted efforts in terms of their management so that those projects conceived using PPP models could deliver the promised benefits.

4.5 Summary and Literature gap

Project success criteria, as well as CSFs have been discussed here in relation to general construction projects but with special emphasis on PPP projects. Existing reports on the performance of PPP projects also need to be examined to understand how well the PPP model has been able to deliver the promised benefits. It is evident that the success of any project, especially a PPP project cannot only be measured by the iron triangle (cost, time and quality) due to the multiple-stakeholders involved in the arrangement; other parameters such as customer satisfaction, issues of sustainability, and the organisation's successful performance need to be considered. Only then can we say that the arrangement has delivered value for money; thus, prior to commencing the project the potential of the PPP arrangement to achieve all this should be demonstrated before it is adopted.

It is pertinent to mention that while evidence abounds that many PPP projects have performed excellently well, many have failed. The majority of these failures have been traced to a lack of experience of PPP arrangement by the parties involved, a long negotiation and concession period, and unpredicted events which can be classified as risk. Whereas in the global context, many researchers have sought to identify the performance level of PPP projects and the possible reasons for their success or failure, with many identifying risks as major impediments to the realisation of promised benefits deriving from the PPP arrangement, it is worth noting that in the Nigerian context, little or nothing has been reported in the area of performance evaluation of PPP projects. This is due largely to the newness of the system in the country as the majority of such projects are only just entering the operational phase. This explains why little has been reported on the causes of poor or good performance in PPP projects in the country. The review of current literature on PPP in Nigeria reveals that although few researchers have looked into risk identification and allocation within PPP projects, none has presented a comprehensive and holistic theoretical or practical framework for managing unpredicted setbacks to PPP projects in Nigeria.

The quotation at the beginning of this chapter suggests that if we cannot measure something, we cannot understand that thing and if we can't understand it, we can't control it. Thus improving such a thing will be a mirage as it is impossible to improve what you cannot control. The next chapter therefore presents a report of efforts in the area of risk management both in the global context and in Nigeria in particular, with the intention of understanding efforts thus far, and by addressing the possible gaps that this research has sought to fill.

CHAPTER 5

RISK MANAGEMENT IN PPP PROJECTS

"When a risk occurs, with some entrepreneurial ingenuity, this may open up an opportunity, and conversely when pursuing an opportunity there will be associated risks. Risks are generally deemed acceptable if the possible gains exceed the possible losses".

- Rory Burke, 2003.

5.1 Introduction

The main objective of project management is to maintain a good balance between the three conventional objectives of any construction project (cost, time and quality). Anything that may threaten the achievement of these objectives and prevent the project manager from meeting such targets is considered a risk to the project. Risk is a permanent element in every decision-making process, including design and planning decisions. Risk, which may be difficult to deal with, is inherent in every human endeavour. As such, it is important to understand the nature of risk if an informed decision is to be made, particularly in the case of PPP projects that require different parties to work together towards a common goal, each with varying targets and objectives. It is essential to understand these risk factors if their possible gains and possible losses are to be evaluated and appropriate decisions on what to do about them are made. This chapter describes risk, the nature of risk in PPP projects and the need for a risk management culture in any organisation involved in PPP projects, particularly in developing nations, where the PPP concept has just begun to gain recognition.

5.2 Risk and PPP projects

Many researchers have defined risk based on their perceptions of the needs or outcomes of their studies. For example, Wideman (1986) and Akintoye and Macleod (1997) define risk as the likelihood of unforeseen factors occurring, which would adversely affect the successful completion of the project in terms of cost, time and quality. Cooper and Chapman (1987) define risk as "the exposure to the possibility of economic or financial loss or gain, physical damage or injury, or delay as a consequence of uncertainty associated with pursuing a particular course of action." Skorupka (2008) asserts that the term 'risk' is derived from an Italian verb "riscare", meaning "to have the cheek to do something". Risk to the economist focuses on the financial aspects,

engineers relate risk to process disruption and cost, the military considers the risk of completing a task, police officers treat risk as threat to citizens, and employees may see risk as being dismissed from work.

It is therefore imperative to clearly specify the meaning of risk in this study. The definition given in the Project Management Body of Knowledge Guide (PMBOK, 2004) is adopted here. The PMBOK Guide (2004) defines project risk as an uncertain event or condition that, if it occurs, has a positive or a negative effect on at least one project objective, such as time cost, scope or quality. Two factors are very important in the definition. The first is the possibility of loss or gain in any risk situation. Risk concerns deviation from a desired target and loss and gain are possibilities at all times. It is possible to have cost overrun or cost under-run; time overrun or under-run are also possible. When a positive gain occurs, most people are not affected. However, when adverse effects are experienced (if, for example, the project manager fails to meet set objectives) people are likely to become angry or may be unhappy with the outcome. It is now commonly realised that risk and opportunity should go together. Kloppenborg (2009) suggests two tactics that project managers and teams can adopt in addressing risks. Firstly, any risk that may inhibit successful project completion (to the satisfaction of stakeholders, on time, and on budget) needs to be identified and a plan must be developed to overcome it. Secondly, a risk that can have a positive effect on a project should be considered as an opportunity to complete the project in a more satisfactory manner, faster, and or at a lower cost, and a plan should be developed to capitalise upon it. The implication is that risk has the potential to cause loss, which is often termed the downside risk. Smith *et al.*. (2002) state that loss can be financial, or related to loss of time, corporate image or a drop in quality. There is also the possibility of the event leading to favourable outcomes in which matters turn out better than was planned; this is referred to as the upside of risk**.** The focus in this chapter is on the downside of risk, namely the unfavourable impacts such events can have on project objectives when they occur, since the overriding intention of most risk management actions is to minimise potential losses.

Given the complexity, size, time frame of concession contracts, and the multitude of stakeholders involved, the delivery methods of PPP projects have been judged to be full of risks (Xenidis and Angelides, 2005). An extensive review of related literature, including Akintoye *et al.* (1998); Li *et al.* (2005), Ayeni (2005); Ibrahim and Price (2006); Xenidis and Angelides (2005) and Ibrahim *et al.* (2006), reveals a total of 68

risk factors related to PPP projects generally. It is also likely that differences in the opinions of key stakeholder groups exist. The classification into two broad categories, as adopted from Ibrahim *et al.* (2006), is used in this study. These are exogenous risks (risks external to the particular project under consideration) or endogenous (risk events and consequences that occur within the system boundaries of the project being considered; this includes risks occurring in the relationships between stakeholders due to the inherent differences between the working practices and strategies of the private and public sectors). (A list of the risk factors in PPP projects as identified from the literature is shown in Table 5.1a and b).

Table 5.1a: Classification of risk factors associated with PPP projects (Endogenous)

S/No	**Endogenous risk factors**		
1	Land acquisition/site availability.	23	Manpower problem associated with trade unions.
2	Level of demand for the project.	24	Late design changes.
3	Prolonged negotiation period prior to initiation.	25	Poor quality of workmanship.
4	Competition risk.	26	Excessive contract variation.
5	Fault in tender specification.	27	Insolvency/default of subcontractors and suppliers.
6	Availability of finance.	28	Risk regarding pricing of product/service.
7	High finance cost.	29	Operational revenue below projection.
8	Lack of creditworthiness.	30	Operation cost overrun.
9	Liquidity.	31	Low operating productivity.
10	Depository.	32	Maintenance more frequent than expected.
11	High bidding costs.	33	Maintenance cost higher than expected.
12	Inability to service debt.	34	Competitive market (a product with close substitute).
13	Lack of government guarantees.	35	Life of facility shorter than anticipated.
14	Bankruptcy of concessionaire.	36	Inadequate experience in PPP.
15	Financial attraction of project to investors.	37	Organization and coordination risk.
16	Residual value (after concession period).	38	Inadequate distribution of responsibilities and risks.
17	Delay in project approvals and permits.	39	Lack of commitment from public/private partner.
18	Design deficiency	40	Inadequate distribution of authority between partners.
19	Unproven engineering techniques.	41	Different working methods/know-how between partners.
20	Construction cost overrun.	42	Counter party's creditworthiness.

21	Construction time overrun.	43	Staff crises.
22	Availability of appropriate labour/material.	44	Third party tort liability.

Table 5.1b: Classification of risk factors associated with PPP projects (Exogenous)

S/No	Exogenous risk factors		
1	Unstable government.	13	Corruption and lack of respect for law.
2	Possible expropriation/ nationalisation of assets.	14	Import/export restrictions.
3	Poor public decision making process.	15	Rate of return restrictions.
4	Strong political opposition/hostility.	16	Industrial regulation change.
5	Inconsistencies in government policies.	17	Lack of tradition of private provision of public services.
6	Poor financial market.	18	Public opposition to projects.
7	Inflation rate volatility.	19	Non-involvement of host-community.
8	Interest rate volatility.	20	Cultural differences between main stakeholders.
9	Exchange rate fluctuation.	21	Force majeure.
10	Influential economic event (boom/recession).	22	Weather.
11	Legislation change/inconsistencies.	23	Environment.
12	Change in tax regulation.	24	Geotechnical conditions.

However, due to the fact that the application of PPPs is very new in Nigeria, knowledge of these risk factors on the part of the stakeholders (particularly internal stakeholders who handle the day-to-day running of the project) is lacking. It is therefore imperative that when developing a market, parties need to consider what may go wrong. It is also necessary to make forecasts or projections to determine the sort of goods to be brought to the market in the future and the type of space required the type of people who will use the service and their budgets. These questions all need to be answered as accurately as possible. The decision on whether or not to proceed will need to be taken in the face of many uncertainties and risks. The identification, classification and presentation of a comprehensive list of these risks and an appropriate framework for managing them will provide prospective PPP practitioners in Nigeria and other developing countries with a

useful tool during the establishment and management of successful PPP concession agreements.

5.3 Risk Management Process

Risk management involves maximising opportunity, namely increasing the probability and impact of positive events, and decreasing the probability and impact of adverse events. While corporate governance may be described as the glue that holds the organisation together in pursuit of its objectives, risk management provides the resilience. Risk management is a formal and orderly process of systematically identifying, analysing, and responding to risks throughout the lifecycle of a project in order to obtain the optimum degree of risk elimination, mitigation and/or control. Kezsbom and Edward (2001) stated that risk management is an important and integral element of project management. All managers (and indeed all human beings) manage risk either consciously or unconsciously, but rarely systematically. Managing risk is a forward-thinking act in which individuals or groups take a look at the future of a particular process or endeavour to identify, in a responsible manner, the downsides or upsides of actions or inactions. This enables balanced thinking to be achieved, which provides a framework to facilitate more effective decision-making.

Smith and Merritt (2002) suggest that project risk management has become a popular management topic as many organisations now recognise the high cost of dealing with project problems that could have been anticipated. Risk management continues to be a major feature of project management and is assuming increasing importance around the world. The popularity of risk management in the management arena is a product of the following factors: (1) global economic problems or budgetary constraints; (2) recognition of the true cost of underperformance; (3) legislation; (4) competitiveness of global markets; and (5) the true payback of risk management.

Flanagan and Norman (1993) and Raftery (1994) define risk management as a process comprising the following main steps: risk management planning, risk identification, risk assessment, risk analysis, risk response, risk monitoring and risk communication. Dey (1999) suggests that project risk management processes are threefold: (i) identifying risk factors; (ii) analysing their effect; and (iii) responding to risk. Chinyio and Fergusson (2003) assert that risk management should be approached as an iterative process, and not in the discrete phases of identification, evaluation and control. They argue that the identification of risks should be followed by a search for solutions that

can ameliorate or eliminate these risks. Winegard and Warhoe (2003) suggest that the risk management process should follow five consecutive steps: identification of risk, risk assessment and analysis, risk mitigation, namely the development of risk reduction and reaction to threats; implementation of risk management plans; and the review and correction of risk assessment.

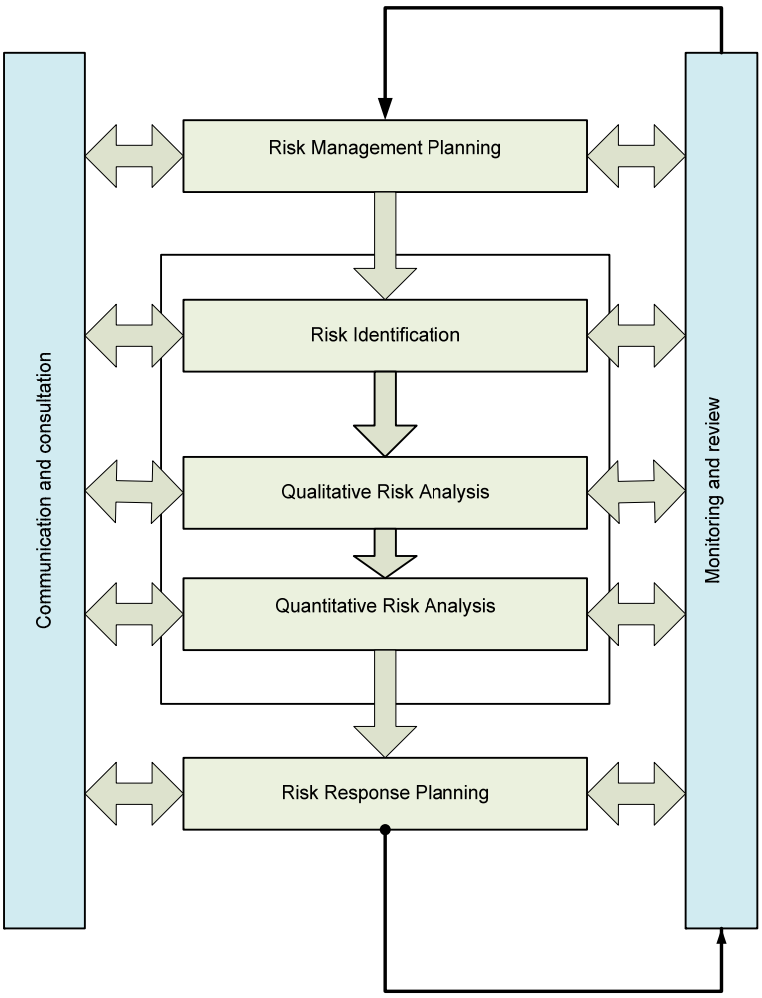

Figure 5.1. Risk Management Processes
Source: Adapted from AS/NZS 4360:2004, Risk Management Guidelines

PMBOK (2004) describes the six stages of the project risk management processes:

(i) Risk Management Planning (RMP): deciding how to approach, plan, and execute the risk management activities for a project;

(ii) Risk Identification: determining which risks might affect the project and documenting their characteristics;

(iii) Qualitative Risk Analysis: prioritising risks for subsequent further analysis or action by assessing and combining their probability of occurrence and impact;

(iv) Quantitative Risk Analysis: numerically analysing the effect on the overall project objectives of identified risks;

(v) Risk Response Planning: developing options and actions to enhance opportunities and to reduce threats to project objectives;

(vi) Risk Monitoring and Control: tracking identified risks, monitoring residual risks, identifying new risks, executing risk response plans, and evaluating their effectiveness throughout the project life cycle.

These six stages are represented in Australia Standards and New Zealand Standards in 2004, as shown in Figure 5.1. They are discussed in turn as follows:

5.3.1 Risk Management Planning

"Winning is the science of being totally prepared." "To fail to plan is planning to fail." These two popular sayings highlight the importance of planning, which is normally taken for granted, to most companies. Kerzner, (2009) asserts that the primary benefit of not planning is that failure will then come as a complete surprise rather than being preceded by periods of worry and depression. Risk Management Planning (RMP) is therefore a crucial part of the risk management process and determines the success of all other processes. To be totally prepared means to be ready to deal with a situation. RMP can therefore be described as making every possible effort towards deciding how best to approach and conduct risk management activities for a particular project or process. As in general project planning, in which a project management plan is developed, the outcome of RMP is the production of a risk management plan (RMP) that forms part of the overall project management plan (PMP). This depends on the size and the complexity of the project. In small projects, for example, risk management may be informal, whereas for large, complex projects, it is necessary to develop and prepare a written risk management plan.

When preparing the RMP, managers rely greatly on a good historic database that details and records the attitudes and tolerance of their organisations and the people they have worked with towards risk. Moreover, it is possible that their organisations have predefined approaches to risk management. For instance, the organisation may have developed standard templates for risk planning, making it easy for managers to use the

template provided they exert some level of care. Whilst it is possible to generalise or adopt a given risk template for all projects in an organisation, some projects may have inherent specific or unique risk elements.

After consideration of attitudes towards risk as well as well as the risk tolerance of the organisation, managers need to evaluate project risks through the statement of work (SOW) and examine the work breakdown structure (WBS) for the project in order to understand the sources of risks. Using the SOW and WBS to assess the roles and responsibilities of the people that will be involved in risk planning would enable a thorough evaluation of the risks associated with sub-tasks to be carried out separately (Dey, *et al.*, 1994). In this respect, a good RMP gives a brief summary of the approach, tools, data sources that are to be used to performing risk management on the project. It should also define the roles of the risk management team members (for every activity in the risk management process) along with their responsibilities. The plan also assigns resources and contains estimates of the costs needed for risk management, and defines when and how often the risk management process will be performed throughout the project lifecycle. Finally, the RMP provides a structure to ensure a comprehensive process of systematic identification of risk to a consistent level of detail and contributes to the effectiveness and quality of risk identification, which is the next process in risk management. Project team members need to hold a planning meeting to enable them to develop the RMP. This meeting is usually attended by the project manager and selected project team members, depending on the complexity of the project, and by other stakeholders, namely anyone in the organisation responsible for managing risk planning and execution.

In summary; if the organisation has pre-defined approaches to risk management, for instance, standard templates for risk categories and definitions of terms, such as levels of risk, probability by type of risk, impact by type of objectives, the probability and impact matrix can then be tailored to a specific project. In the absence of such predefined templates for planning, the project manger will need to create new templates and discuss these with colleagues who work on similar projects or who have done so in the past. This helps to establish the standard for use on subsequent projects. Risk planning therefore helps managers to determine the feasibility of risk management activities in order to decide whether the effort is worthwhile when compared to the resources or time expended against the risk exposure.

5.3.2 Risk Identification

Risk identification is a process for uncovering any risks that could potentially affect a process. This step is of considerable importance as other processes such as risk analysis and response can only be undertaken on the potential risks that have been identified. Risk identification is a simple but difficult task as there are no absolute procedures that may be used to identify risks in a project. Managers often rely heavily on their experience and on the insight of other key personnel involved in the process. Depending on the process documentation available and the nature of the process, a variety of considerations may prompt risk discovery. Regarding risk, Smith and Merritt (2002) note that managers need to focus on the interface between the consultant and the client, between departments of the client organisation, between phases or tasks of a client process, or between geographic areas. They further suggest that the project schedule should clearly show dependencies between tasks in order to help pinpoint risk-prone areas. Alternatively, managers may use process maps that show interfaces between processes or tasks. Flanagan and Norman (1993) compared attempts at risk identification in projects with multiple layers of planning, complex vertical and horizontal interactions.

Organisations that keep good a record of their past projects or project managers who conduct reviews of their projects at closure can use this knowledge and experience to garner insights into potential risks. Furthermore, a good project scope statement will detail all assumptions in the project, making it easier to evaluate uncertainty and determine project assumptions. The outcome of the risk identification exercise is a document called the risk register. This document includes, *inter-alia*, a list of identified risks, including their root causes and uncertain project assumptions. The potential responses to a risk may often be identified at the risk identification stage. These potential responses will also be recorded in the risk register, which becomes a useful input to the risk response planning process.

Moreover, in order to choose the appropriate technique for identifying risk, practitioners should consider several factors, such as the organisation's objectives, the nature of the project in terms of size and duration and the company's strategies for risk management. The following are some of the tools and techniques suggested by the PMBOK guide (2004):

- Documentation review;
- Information gathering techniques;

- Checklist analysis;
- Assumptions analysis;
- Diagramming techniques.

These can be supported by information gathering techniques for risk identification, which include brainstorming, the Delphi technique, interviewing, root cause identification and strengths, weakness, opportunities and threats (SWOT) analysis.

5.3.3 Risk Analysis

In the risk analysis stage, managers try to estimate the overall magnitude of the risk, and the expected losses. Typically, the risk event drivers and their impact drivers are determined at this stage. Any risk event that cannot be justified through probability of occurrence and impact is automatically dropped from the risk register. Broadly speaking, risks can be analysed either qualitatively or quantitatively, depending on the purpose, required degree of detail, and the data and resources available for analysis. These are discussed in turn below.

5.3.3.1 Qualitative Risk Analysis

In qualitative analysis, risks are subjectively estimated and ranked in a descriptive manner. Jiang *et al.* (2002) describe qualitative risk analysis as the process of prioritising risks for subsequent further analysis or action by assessing and combining their probability and impact. Qualitative estimation can be used for the following purposes:

- as an initial screening activity to identify risks that require more detailed estimation;
- when it provides sufficient information for decision making; or
- where available data or resources are insufficient for a quantitative estimation.

Because of such analysis, risks can be rated, for example, as high, moderate, or low. Qualitative risk analysis is usually a rapid and cost-effective means of establishing priorities for risk response planning, and lays the foundation for quantitative risk analysis. As in risk identification, reviews of process documentation, past experiences or lessons learned from previous projects can be good sources of the information needed to prioritise the identified risks. This enables an update to be made to the risk register. Risks are listed in terms of their probability and impact in matrix form, which the project manager can use to focus attention on those risks with high significance to the

project where responses can lead to better project outcomes. In the risk register, risks may also be grouped by categories showing the root causes of risks or areas of the project that require particular or urgent attention and those that can be handled later. From this, some risk items will go straight to the response stage, while some may require further analysis, such as quantitative risk analysis.

5.3.3.2 Quantitative Risk Analysis

Quantitative risk analysis is performed on risks that have been prioritised through the qualitative risk analysis process as potentially and substantially influencing the project's competing demands (PMBOK, 2004). Quantitative risk analysis is the process of numerically analysing the effect on overall project objectives (Kloppenborg and Deborah, 2004). The evaluation of both consequences and probability are based on data from a variety of sources, for example past project records, collected field data, experimental data (including prototype testing). Quantitative risk analysis is often used when the need to predict with confidence the probability of completing a project on time, on budget, at the agreed-upon scope, and/or the agree-upon quality is critical (Kloppenborg, 2009). Dey and Ogunlana (2004) identified some of the quantitative risk analysis tools and techniques currently in use:

- Statistical Probability Distribution;
- Simple Multi-Attribute Rating Technique;
- Expected Value Technique;
- Sensitivity Analysis;
- Decision Trees;
- Bayes' Theorem;
- Simulation;
- Utility Theory;
- Analytic Hierarchy Process;
- Fuzzy-set Theory;
- Neuro-Fuzzy Networks;
- Financial Methods.

After the identified risks have been analysed quantitatively, the risk register initiated in the risk identification stage is then updated accordingly. Risks are prioritised according to the level or threat posed or opportunity offered.

5.3.4 Risk Response Planning

After the risk has been estimated, it should be determined whether or not the risk level is acceptable by comparing it with the acceptance criteria determined at the risk management planning stage. Risk response planning therefore involves determining in advance how to respond to each major risk. Minor risks are handled by simply being aware of their potential and dealing with them if and when they occur. Kloppenborg (2009) identifies six types of risk response strategies that can be applied to major risks: (i) avoid, (ii) transfer, (iii) mitigate, (iv) accept, (v) research, and (vi) exploit. PMBOK (2004) categorises risk response under four main headings:

- Strategies for threats (those risks that have negative impacts) are avoid, transfer and mitigate;
- Strategies for positive risks (opportunities) are exploit, share, and enhance;
- Strategy for both threats and opportunities is acceptance;
- Contingent response strategies (strategies put in place for use only if certain events occur).

It must be stated that the above approaches are not mutually exclusive and that in most cases a combination of them will provide the most efficient solution. It is also important to note that risk response measures should be addressed as part of the initial risk assessment during the planning stage, as many risk response measures may be impossible or costly to implement once the structure has been commissioned. After proper consideration of risk response alternatives, the most appropriate ones should be selected and implemented. New risks that could be introduced by the risk treatment used should also be identified, assessed, treated and monitored. Action plans must be taken seriously if they are to work. This means they become another task in the project and require a budget, schedule and labour resources just as with any other project task (Smith and Merrit, 2002).

5.3.5 Risk Mitigation Strategies

As mentioned earlier, the downside aspect of risk, namely those risks that pose a threat to the realisation of the project objectives, is of concern. There is therefore a need to seek solutions to the effects or the occurrence of these risks. Examination of the strategies suggested by PMBOK (2004) for risks that have negative impacts suggests

that avoidance, transfer or mitigation could be used. Gray and Larson (2003) suggest mitigating, avoiding, transferring, sharing or retaining as responses to risks.

Risk avoidance is often referred to as risk elimination or risk aborting, as actions to avoid the risk can involve the complete elimination of risk (Chinyio and Fergusson, 2003). Chinyio and Fergusson (2003) argue that these actions can be drastic, for example a client refusing to proceed with a very risky project. Risk avoidance may also entail changing the project plan to eliminate the risk or condition. It must be noted that it is impossible to eliminate all risk events, but some specific risks may be avoided before launching the project.

Transferring risk aims to pass risks on to another party. This may be done through the use of insurance and bonds. This transfer does not change risk and always results in paying a premium for the exemption. In risk-sharing, risks are allocated in proportion to different parties involved in the project. Mitigating risk involves two basic strategies: (1) reducing the likelihood that the event will occur and/or (2) reducing the impact that the adverse event would have on the project. Finally, in some cases a conscious decision is made to accept the risk of an event occurring. For instance, a risk such as an earthquake or flood may be retained by the project owner as the magnitude of the risk is too big and the probability of it occurring is low. It worth noting that the more effort given to risk response before the project begins the better the chances of minimising project surprises. Appreciation of the project's risk profile, allocation of risk to the appropriate parties best able to manage it and the choice of risk response provides the basis for selecting the most appropriate procurement strategy.

Risk allocation is prevalent in PPP projects and the use of appropriate forms of contract implies that risks will be distributed or shared in an equitable way that will in turn reduce uncertainty for all parties. It is common for the public sector body procuring a PPP project to first state its preference as to how the project risks should be shared between it and the private sector participant. Individual bidders assess the client's proposition and either concur or disagree (Chinyio and Fergusson, 2003). Dallas (2006) suggests that one of the key principles of PPP is for the public sector to retain only those risks that pertain to its core business of service delivery, with all risks relating to the design, construction and management of a facility, from which the services are delivered, allocated to the private sector contractor.

It should be noted that communication and consultation are important considerations at each step of the risk management process. Effective communication can help ensure

that those responsible for implementing risk management and stakeholders understand the basis on which decisions are made and why particular actions are required. Since stakeholders have a significant impact on the decisions made, it is important that their perceptions of both risks and benefits be identified and documented and that the underlying reasons for them are understood and addressed appropriately.

5.3.6 Risk Monitoring and Control

Risk monitoring and control is the process of identifying, analysing, and planning for newly arising risks, keeping track of the identified risks and those on the watch list, reanalysing existing risks, monitoring trigger conditions for contingency plans, monitoring residual risks and reviewing the execution of risk responses while evaluating their effectiveness (PMBOK, 2004). It is therefore apparent that managers responsible for risk monitoring and control try to focus on the proposed processes and responses available for the identified risks. The outputs of the other five stages must be kept under review as things evolve. Changes in the environment, or simply the discovery of better information, may render the original assessment out of date, thereby triggering the need for reassessment. Periodic reassessment of risks (re-measurement) and risk audits should be carried out. Risk audits examine and document the effectiveness of risk responses in dealing with identified risks and their root causes, as well as the effectiveness of the risk management process.

Kerzner (2009) argues that risk monitoring and control is not a problem-solving technique but is rather a proactive technique to obtain objective information on the progress to date of reducing risks to acceptable levels. Earned Value Analysis or other methods of project variance and trend analysis (for example programme metrics, scheduled performance monitoring and technical performance measurement) could be used to monitor overall performance; deviation from the baseline plan may indicate the potential impact of new threats. It is not generally necessary to begin the whole process over again when this happens unless the change or deviation is particularly profound, though those parts that are directly affected by changing circumstances must be brought up to date.

Despite this understanding of risk management processes, risk management exercises are not without some difficulties. Chinyio and Fergusson (2003) identified some difficulties practitioners usually face when doing risk analysis and management. These

are: (i) absence of a risk management culture; (ii) lack of certainty in the efficacy of risk assessments; (iii) inadequate historic data to support risk assessment; (iv) recourse to subjective assessments rather than the use of objective measures due to a dearth of data; (v) differing perceptions on the magnitude of risks; (vi) lack of commitment and a clear strategy from the client; (vii) lack of requisite expertise; (viii) the long duration of PFI schemes; (ix) late start to the risk management exercise; (x) the dynamic nature of PFI risks; (xi) unstructured nature of risk assessment; and (xii) transient expertise. In their opinion, problems could be reduced by: (a) the consolidation of databases for PPP risk assessment purposes; (b) the training of risk analysts; (c) devoting adequate time to risk analysis; (d) facilitating a better understanding of risks; (e) motivating clients; (f) seeking advice from experts; (g) detailed planning; (h) adopting a more structured approach; (i) not over-engineering risk assessment; (j) acquiring and retaining experience; and (k) standardisation of risks.

Successful of management of risk is usually the product of a successful organisation that has stressed the importance of careful planning to its employees, as in the case of Total Quality Management (TQM) and Japanese companies during the industrial revolution. Barkley (2004) argues that careful planning involves several core competencies: the capacity to assess the dimensions of uncertainty and risk, integrating risk identification and assessment into programme and project planning and building and sustaining a support system for risk management that provides essential information when it is needed. This is equivalent to building a risk management culture within the organisation and implies that risk management process is internalised into the organisation's daily work. The assumption is that risk management within the organisation is seen by the management as "Something I want my people to do in the normal course of their work," rather than "Something I want a specialist to do in the project as a separate audit exercise" (Barkley, 2004). Exactly how an organisation builds risk into its daily work and how executives use their leadership and institutional leverage to further good risk management remains in question.

5.4 Building a Risk Management Culture

A risk management culture can be defined as "the prevailing standard for how risk is handled" (Barkley, 2004). An organisation with a strong risk management culture has policies and procedures that require its workforce to go through disciplined risk

planning, identification, assessment, and risk response project phasing. Organisations with a risk management culture do not treat risk management as a separate process, but rather embed the risk process into the whole project planning and control process. Risk then becomes an integral part of the thinking of its core members of staff. In the same way that the quality movement matures to the point that quality assurance and statistical process control processes become institutionalised into the company rubric, risk assessment tools and response mechanisms become an indistinguishable part of the company mosaic in a mature organisation (Barkley, 2004).

This is in line with Dallas (2006), who argues for the implementation and review of risk management throughout the entire life cycle of any project as shown in Figure 5.2. Dallas asserts that this will allow project managers to always be able to answer questions such as whether the risks are acceptable, whether conditions are in place to proceed, whether risks are allocated appropriately, whether risks are under control, what can be learned for the future and whether the business is sustainable.

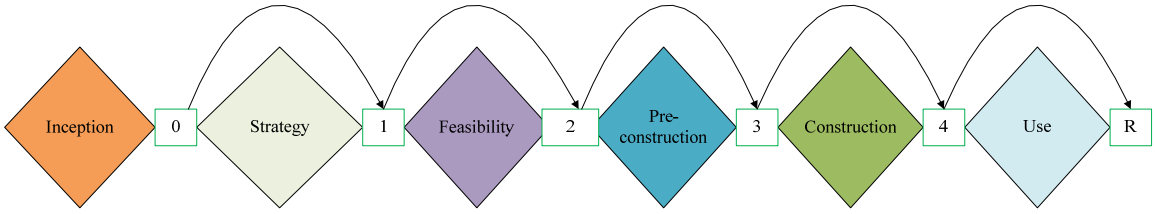

Figure 5.2. Risk Management Implementation and review activities

Source: Adapted from Dallas, (2006).

For any organisation to be successful in risk management, Barkley suggests that it must develop its competence in the following areas: (i) active training and development in risk planning and management, (ii) a strong linkage between corporate planning and project planning, particularly between business analysis of threats and opportunities, and analysis of project risks, (iii) in-depth project experience in its industry, (iv) capacity to document project experience and learn as an organisation and (v) develop a workforce of strong functional managers who address product quality as a risk reduction issue. A question may then be asked about what an organisation would gain by doing all these. A number of studies have attempted to identify the benefits that can be expected by those organisations that are implementing a structured approach to risk management (Oldfield and Ocock (1997); Newland, (1997)). There are both tangible

and intangible benefits to building a risk management culture. The tangible or measurable benefits of risk management include:

(i) Better informed and achievable project plans, schedules and budgets;
(ii) Increased likelihood of project meeting targets;
(iii) Proper allocation of risk through the contract;
(iv) Ability to avoid taking on unsound projects;
(v) Better allocation of contingency to reflect risk;
(vi) Recording metrics to improve future projects;
(vii) Objective comparison of risk exposure of alternatives;
(viii) Identification of best risk owner.

Other soft or intangible benefits of risk management include:

(i) Improved communication;
(ii) Development of a common understanding of project objectives;
(iii) Enhancement of team spirit;
(iv) Focused management attention on genuine threats;
(v) Facilitates appropriate risk-taking;
(vi) Demonstrates professional approach to customers.

5.5 Summary and Literature gap

The chapter has discussed the fact that risk emanates from the uncertainty associated with pursuing course of action. When procuring PPP projects, there is a possibility that some unforeseen events may occur that will adversely affect the successful completion of the project in terms of cost, time and quality. Possible risk events that may affect PPP projects generally and the various processes involved in risk management have been described. The chapter has argued for the embedding of risk management culture into the organisation involved in PPP projects (public or private sector) as risk in one project may not be the same as in another. A review of the literature shows that risk is a permanent element of each decision-making process, including the building of risk management culture. Risks are inherent in every human endeavour and it may be difficult to deal with them. Rather than developing a general framework for risk management that gives a broad knowledge of risk management, it is more important to develop a proper management framework that examines risk in a specific sector or project, thus providing an in-depth understanding of possible surprises in such a project.

5.6 Refined research questions

In this thesis the review of extant literature has focus on four major areas: (i)The Nigerian construction industry see chapter 2; (ii) Public Private Partnership (PPP) for infrastructure development see chapter 3; (iii) Performance evaluation of PPP projects see chapter 4; and (iv) Risk management in PPP projects see chapter 5.

Emerging from the review of extant literature in these areas revealed therefore that:

(i) PPP project are prone to risk especially in developing economies where there are little or no experience of PPP (Xenidis and Angelides, 2005 and Ibrahim *et al.* 2006). Thus this justifies the first research question i.e. *what are the risk factors affecting PPP projects in Nigeria as a developing economy?*

(ii) It was further revealed that to manage these risks, they need to be allocated to the party that can best handle it (see Akintoye, 2000, Dada et al. 2006 in chapter 5). Thus the second and third can be subsumed into one question and can be refined as " *How are the identified risk factors allocated among the parties involved in PPP market projects in Nigeria*"?

(iii) In the same vein, from the literature, it was gathered that markets are service providing infrastructure and the satisfaction of the stakeholders (i.e. internal and external stakeholder) are very important. Therefore the fourth research question can be refined as "*what is the impact of the identified risk factors on stakeholder satisfaction with the privately financed market projects in Nigeria"*?

(iv) It was revealed in chapter 5 that management of risks after evaluation of the risks involves applying practical response to the risk. Therefore this justifies the fifth research question and can be refined as "*what are the practical mitigating measures for the identified risk factors in privately financed market projects in Nigeria?* The rest of the work in this thesis will therefore focus on providing answers to the research questions.

CHAPTER 6
RESEARCH METHODOLOGY

"The method for scientific investigation is nothing but the expression of the necessary mode of working of the human mind. It is simply the mode at which all phenomena are reasoned about, rendered precise and exact."

- *T.H. Huxley in* Darwinian *(1863)*

6.1 Introduction

One of the most significant aspects of any academic research paper is the research methodology section. Having carried out a thorough literature review of previous studies relating to a particular topic and obtained full comprehension of the methodologies employed by others in their studies, an appropriate methodology for one's own study can be established which provides: (i) a means of describing the knowledge and experience, and offering a certain level of generic structure to the approach used and (ii) the provision of an assurance that appropriate research procedures are followed in the course of the research. This chapter therefore gives a comprehensive account of the methodology that was used when conducting this research. Issues such as the knowledge claims, strategies of enquiry and specific research methods adopted were discussed, and the combination of all three (i.e. philosophy, strategies and methods) provided the framework for the research.

6.2 Research Design/Approach

In order to produce a plan that guides the process of collecting, analysing, and interpreting observations or data for this study, it is important to first establish the epistemological premise on which the study stands. In other words, in order to generate a plan, a research design/blue print on how to advance new knowledge about the concept of risk management in PPP market projects in Nigeria must first be established, which according to Creswell (2003) involves the intersection of philosophy, strategies of enquiry, and specific methods. There is the need to first establish how claims are made about what knowledge is (ontology), how it is known (epistemology), what value goes into it (axiology), how it is written about (rhetoric), and the processes for studying it (methodology). All these are philosophical assumptions which surely affect the way that claims are made about knowledge that is intended to be upheld or generated. In

order to explain the interaction of these three components, therefore, (i.e. philosophy, strategies of enquiry, and specific methods) Creswell's (2009) idea has been borrowed in order to highlight various research designs, as shown in Figure 6.1 in the form of a framework. The framework shows the different approaches, the varying philosophical worldviews in each of them, and their strategies of enquiry, as well as possible methods employed in each approach.

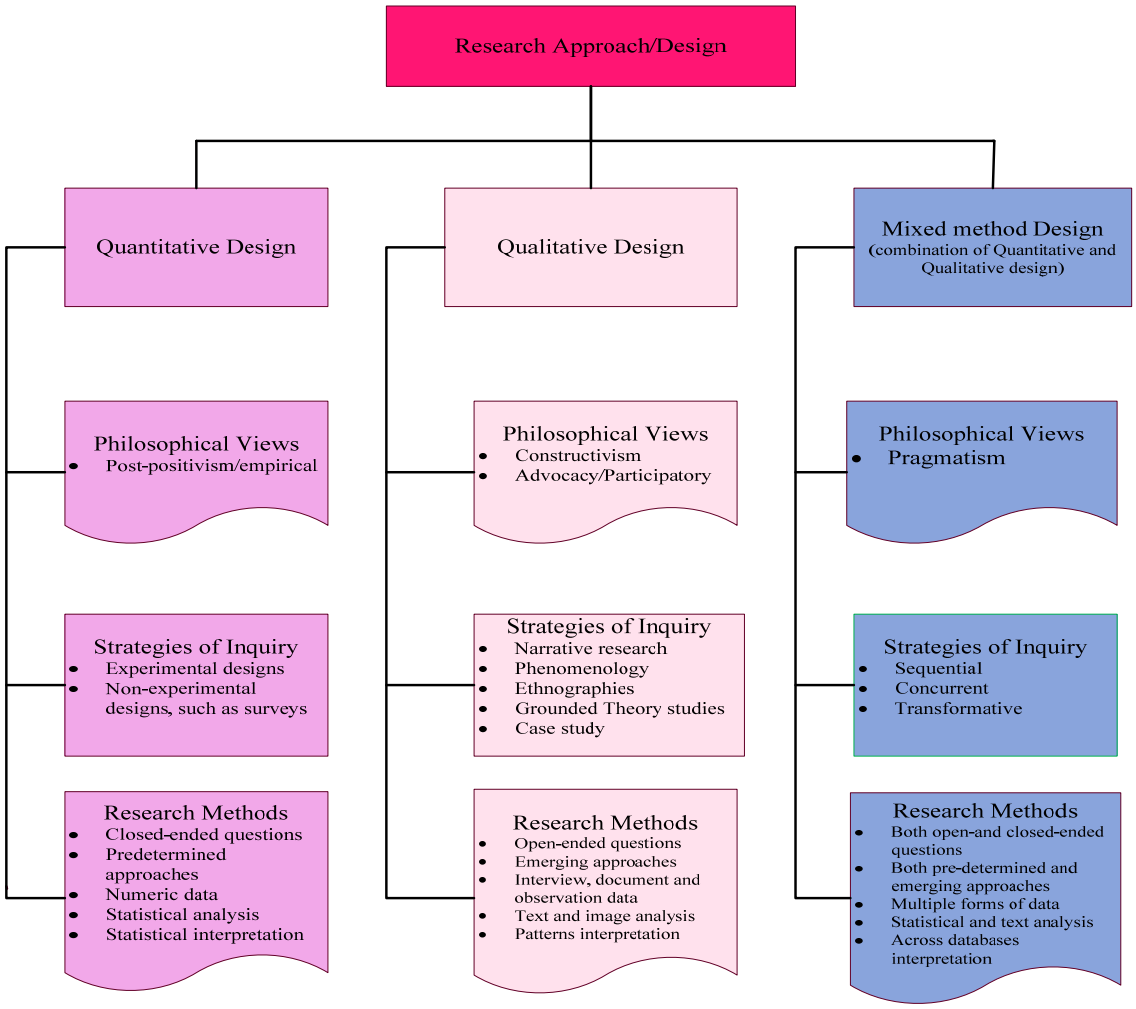

Figure 6.1 Frameworks for Research Design

Source: Adapted from Creswell, 2009, Research Design, Qualitative, Quantitative and Mixed Methods Approach.

These three research approaches (quantitative, qualitative and mixed methods) are therefore discussed regarding their philosophical worldviews, the types of strategies of enquiry adopted and the research methods employed.

6.2.1 Quantitative Research Approach

The historical evolution of the quantitative research approach reveals that this approach dominated forms of research in the social sciences from the late 19th century up until the mid-20th century, before interest in qualitative research rose during the latter half of the 20th century (Creswell, 2009). According to Creswell (2008), quantitative research is a means for testing objective theories by examining the relationship among variables. These variables in turn can be measured, typically on instruments, so that numbered data can be analysed using statistical procedures. Researchers engaged in this form of enquiry have assumptions about testing theories deductively (Creswell, 2009). In other words, they make use of deductive reasoning logic, which is sometimes referred to as the *hypothetico-deductive* method, or the method of conjecture and refutation (Blaikie, 2007). According to Blaikie (ibid) this strategy is based on the *cautious realist* ontology and the epistemology of *falsificationism*. He asserts that Karl Popper is the pioneer and most outspoken advocate of deductive reasoning (see Popper, 1959).

As illustrated in Figure 6.1, the quantitative approach views the world from a post-positivist perspective, and employs experimental strategies of enquiry and pre- and post-test measures of attitudes (Creswell, 2009). It is important here to explain what the post-positivist worldview entails. According to Smith (1983), cited in Cresswell (2009), the post-positivist tradition comes from 19th century writers such as Comte, Mill, Durkheim, Newton and Locke, and has been most recently articulated by writers such as Phillips and Burbules (2000). Creswell summarises the key assumptions of post-positivism, as discussed in Phillips and Burbules (2000), in five key points, as follows:

(i) Knowledge is conjectural (and anti-foundational) – absolute truth can never be found. Thus, evidence established in research is always imperfect and fallible.
(ii) Research is the process of making claims and then refining or abandoning some of them for other claims more strongly warranted. Most quantitative research, for example, starts with the test of a theory.
(iii) Data, evidence, and rational considerations shape knowledge. In practice, the researcher collects information on instruments based on measures completed by the participants or by observations recorded by the researcher.
(iv) Research seeks to develop relevant, true statements that can serve to explain the situation of concern or that describe the causal relationships of interest. In

quantitative studies, researchers advance the relationship among variables and pose this in term of questions or hypotheses.

(v) Being objective is an essential aspect of competent enquiry; researchers must examine methods and conclusions for bias. For example, standards of validity and reliability are important in quantitative research.

Creswell (2009) added that more recently, quantitative strategies have involved complex experiments with many variables and treatments (e.g. factorial and repeated measure designs). He further argues that they have also included elaborate structural equation models that incorporate causal paths and the identification of the collective strength of multiple variables. This approach also employs closed-ended questions and collects data on predetermined instruments that yield statistical information (Creswell, 2003). It can then be summed up that the quantitative approach is best-suited for confirmatory, explanatory and hypothesis-testing purposes.

6.2.2 Qualitative Research Approach

Historically, the number and types of approaches in qualitative research have become more clearly visible during the 1990s and into the 21st century (Creswell, 2009). Since then, many authors have tried to summarise the various types and procedures in qualitative enquiry approaches; notable among them are Wolcott (2011), Clandinin and Connelly (2000), Kemmis and Wilkinson (1998) and Stake (1995). In qualitative research design, the enquirer often makes knowledge claims based primarily on constructivist perspectives (Creswell, 2003). Constructivist worldviews, according to Creswell (2009), hold assumptions that individuals seek understanding of the world in which they live and work. The individuals then develop subjective meanings of their experiences, directed toward certain objects or things. These meanings are varied and multiple, leading the researchers to look for the complexity of views rather than narrowing meanings into a few categories or ideas. In this type of research, the questions are broad and very general so that participants can construct the meaning of a situation, thus relying on participants' views of the situation being studied.

Based on the explanation of interpretivism given by Blaikie (2007), it can otherwise be said that constructivism is the same as interpretivism. According to Blaikie (ibid), in interpretivism, social reality is the product of its inhabitants; it is a world that is already interpreted by the meanings that participants produce and reproduce as a necessary part of their everyday activities together. This explanation agrees with the discussion of constructivitism by Crotty (1998), who argues that meanings are constructed by human

beings as they engage with the world they are interpreting. Crotty (ibid) asserts that the process of qualitative research is largely *inductive*, with the enquirer generating meaning from the data collected in the field. Hempel (1966) described inductive RS as consisting of four main stages: (i) All facts are observed and recorded without selection or guesses as to their relative importance. (ii) These facts are analysed, compared and classified, without using hypotheses. (iii) From this analysis, generalisations are inductively drawn as to the relations between them. (iv) These generalisations are subjected to further testing. Medawar (1969) described inductive reasoning thus "*let us first assemble the data; let us by observation and by making experiments compile the true record of the state of Nature, taking care that our vision is not corrupt by preconceived ideas; then inductive reasoning can go to work and reveal laws and principles and necessary connections*."

Drawing from the work of other researchers on the qualitative research approach, Creswell (2009) identifies five strategies of enquiry that are employed by researchers in the qualitative approach as follows: (i) ethnography, (ii) grounded theory, (iii) case studies, (iv) phenomenological research and (v) narrative research. He further asserts that approaches such as participatory action research and discourse analysis are also viable ways to conduct qualitative studies. In terms of methods, the qualitative approach employs open-ended questions so that participants can share their views. Here, instead of using pre-determined methods of data collection, emerging methods are employed which could involve collecting interview, observation, document and audio-visual data. Collected data is then analysed using text and image analysis and interpreted using themes and pattern interpretation. Although most of the data in qualitative research is descriptive in nature, making it most suitable for exploratory studies which can be useful to build or develop a theory, Creswell (1994) suggests that it could also be designed to be used in confirmatory studies of an existing theory.

Moreover, according to Firestone (1993), sampling for qualitative data is usually purposeful rather than random. Marshall (1996) advanced both theoretical and practical reasons for this as follows: (i) samples for qualitative studies tend to be small and the sampling error of such a small sample is likely to so large that biases are inevitable, (ii) in complex qualitative studies, the characteristics of the whole population are not known, (iii) random sampling of a population requires that the research characteristics should be normally distributed within the population, however there is no evidence that the values, beliefs and attitudes that form the core of qualitative investigation are

normally distributed, and (iv) the fact that people are not equally good at observing, understand and interpreting their own and other people's behaviour makes it difficult to employ random sampling. Marshall opines that choosing someone at random to answer a qualitative question would be analogous to randomly asking a passer-by how to repair a broken-down car, rather than asking a garage mechanic; although the former might have a good stab, asking the latter is likely to be more productive.

Three broad approaches to selecting a sample for a qualitative study have been discussed by Marshall (1996); these are displayed in Table 6.1.

Table 6.1: Approaches to sample selection in qualitative research.

Sample strategies	Characteristics
Convenience sample	✚ Involves the selection of the most accessible subjects ✚ Least rigorous ✚ Least costly to the researcher ✚ Results in poor-quality data ✚ Lacks intellectual credibility
Judgement/Purposeful sample	✚ Involves the selection of the most productive sample to answer the research questions ✚ Most common sampling technique ✚ More intellectual strategy ✚ Results in good-quality data
Theoretical sample	✚ Necessitates building interpretative theories from the emerging data and selecting a new sample to examine and elaborate on the theory. ✚ Most useful for the grounded theoretical approach

6.2.3 Mixed Methods Approach

Historically, the mixed methods approach dates back to the late 1980s with the coming-together of several publications, all focused on describing and defining what is now known as mixed methods (Creswell and Clark, 2011). These authors argue that several

writers working in different disciplines and countries at about the same time arrived at roughly the same idea about mixed methods research. For instance, in the United Kingdom, (Fielding and Fielding, 1986); from management (Bryman, 1988); in the United States from the sociology discipline (Brewer and Hunter, 1989), from evaluation (Greene, Caracelli and Graham, 1989), from education (Creswell, 1994) and from nursing in Canada (Morse, 1991). See Creswell and Clark (2011:23-25) for further information on the contribution of selected writers to the development of mixed methods research.

From the writings of these early authors, different definitions have been advanced for mixed methods research. For example, Greene, Caracelli and Graham (1989) defined mixed methods designs as those that include at least one quantitative method and one qualitative method, where neither type of method is inherently linked to any particular enquiry paradigm. In the same vein, Tashakkori and Teddlie (1998) described mixed methods as the combination of qualitative and quantitative approaches in the methodology of a study. These two definitions only view mixed methods as a mixture of philosophy and methods from both qualitative and quantitative research in a single study. Johnson *et al.*. (2007) provided a more composite definition of mixed methods, having reviewed 19 different definitions provided by 21 highly published mixed methods researchers (Creswell and Clark, 2011). They defined mixed methods research as a type of research in which a researcher or team of researchers combine elements of qualitative and quantitative research approaches (i.e. use of qualitative and quantitative viewpoints, data collection, analysis and inference techniques) for the purpose of breadth and depth of understanding and corroboration. With these definitions in mind and the fact that most mixed methods research stems from several distinct ideas, Creswell and Clark (ibid) opined that a definition that combines methods, a philosophy and a research design orientation or core characteristics of mixed methods research is worthwhile. Creswell and Clark (ibid) then presented these core characteristics of mixed methods research as follows:

(i) Both qualitative and quantitative data are collected and analysed persuasively and rigorously;
(ii) Integration of these two forms of data is done sequentially by having one built on the other concurrently by combining them or embedding one within the other;
(iii) Priority is given to one or to both forms of data depending on what the research

emphasises;

(iv) Researchers use these procedures in a single study or in multiple phases of a program of study;

(v) Researchers frame these procedures within philosophical worldview and theoretical lenses; and

(vi) Combine the procedures into specific research designs that direct the plan for conducting the study.

In terms of philosophical assumptions or worldviews that underpin mixed methods research, the jury is still out as regards the paradigm that best suits mixed methods; however, Tashakkori and Teddlie (2003a) suggested that at least 13 different authors embrace *pragmatism* as the worldview or paradigm for mixed methods research. Thus pragmatism is generally regarded as the philosophical partner for the mixed methods approach (Denscombe, 2008). This gives rise to the need to describe what pragmatism is all about. According to Cherryholmes (1992), pragmatism was derived from the work of Charles Sanders Piere, William James, Mead and John Dewey. He opined that knowledge claims in mixed methods arise out of actions, situations and consequences rather than antecedent conditions (as in postpostivism). There is a concern regarding the applications of 'what works' and solutions to problems. Tashakkori and Teddlie (1998) suggested that rather than methods being important, the problem is most important and researchers should use all approaches to understand the problem. Cresswell (2003), in his interpretation of the works of all these writers on pragmatism, provided the following basis for the use of the pragmatism approach.

(1) Pragmatism is not committed to any one system of philosophy and reality; this applies to mixed methods research in that enquirers draw literally from both quantitative and qualitative assumptions when they engage in their research.

(2) Individual researchers have a freedom of choice; they are free to choose the method, techniques, and procedures of research that best meet their needs and purposes.

(3) Pragmatism does not see the world as being in absolute unity. Similarly, mixed methods researchers look to many approaches to collecting and analysing data rather than subscribing to only one way.

(4) Truth is what works at the time; it is not based on a strict dualism between the mind and a reality completely independent of the mind. Thus, in mixed

methods research, investigators use both qualitative and quantitative data because they work to provide the best understanding of a research problem.

(5) Pragmatist researchers look to the 'what' and 'how' to research based on its intended consequences - where they want to go with it. Mixed methods researchers need to establish a purpose for their mixing and a rationale for the reasons why quantitative and qualitative data need to be mixed in the first place.

(6) Pragmatists agree that research always occurs in social, historical, political and other contexts; in this way, mixed methods studies may include a postmodern turn; a theoretical lens that is reflexive of social justice and political aims.

(7) Pragmatists believe, according to Cherryholmes (1992), that we need to stop asking questions about reality and the laws of nature. He stated that "*they would simply like to change the subject*". Thus, for the mixed methods researcher, pragmatism opens the door to multiple methods, different worldviews and different assumptions, as well as different forms of data collection and analysis.

6.2.4 Reasons for Mixing Quantitative and Qualitative Research Approaches

It is pertinent at this point to identify some of the reasons for the development of the mixed methods approach. There are many good discussions about reasons for combining qualitative and quantitative research approaches. Greene, Carcelli and Graham (1989) presented five reasons for mixing methods. Bryman (2006) provided a detailed list of reasons based on researchers' practices. Creswell and Clark (2011) presented these two efforts in tabular form in their work. Table 6.2 shows Bryman's (2006) reasons for mixing methods, as reported in Creswell and Clark (2011). Creswell and Clark (ibid) argued that being responsive to new insights is an essential aspect of conducting mixed methods research; thus the list of reasons presented in Table 6.2 should not be seen as being conclusive, but should be viewed as a general framework from which researchers can weigh up alternative choices and use to justify their decision to use mixed methods. This assertion corroborates the opinion of Bryman (2006) when he noted that many researchers employ these methods for multiple reasons and that new reason for mixing may emerge while the study is underway.

Table 6.2 Reasons for mixing qualitative and quantitative research methods

Reasons	Description
Triangulation or greater validity	Combining quantitative and qualitative methods to triangulate findings in order that they may be mutually corroborated.
Offset	Combination helps to offset weaknesses of both methods and allows the research to draw on the strength of both
Completeness	Refers to the notion that the researcher can bring together a more comprehensive account of the area of enquiry in which he or she is interested if both methods are employed
Process	Refers to when quantitative methods provide an account of structures in social life but qualitative methods provide a sense of process
Different research questions	Refers to the argument that each of the methods can answer different research questions
Explanation	Using one to explain findings generated by the other
Unexpected results	Refers to the suggestion that both methods can be fruitfully combined when one generates surprising results that can be understood by employing the other
Instrument development	Refers to contexts in which qualitative research is employed to develop a questionnaire and scale items so that better wording or more comprehensive closed answers can be generated
Sampling	Refers to situations in which one approach is used to facilitate the sampling of respondents or cases
Credibility	Suggestions that employing both approaches enhances the integrity of the findings
Context	Providing contextual understanding by qualitative research coupled with either generalisable, externally valid findings or broad relationships among variables uncovered through a survey
Illustration	Using qualitative data to illustrate quantitative

	findings, often referred to as putting "meat on the bones" of dry quantitative findings
Utility or improving the usefulness of findings	Combining the two approaches will be more useful to practitioners and others
Confirm and discover	Refers to using qualitative data to generate hypotheses and using quantitative methods to test them within a single project
Enhancement or building upon quantitative and qualitative findings	Entails making more of or augmenting either quantitative or qualitative findings by gathering data using a qualitative or quantitative research approach

Source: Adapted from Creswell and Clark (2011), Designing and Conducting Mixed Methods Research

Furthermore, when choosing a mixed method design for use in a study, researchers need to make decisions concerning (i) the level of interaction between the strands (i.e. qualitative and quantitative strands), (ii) the relative priority of the strands, (iii) the timing of the strands, and (iv) the procedures for mixing the strands (see Creswell and Clark, 2011, for detailed discussion on each of the areas). Figure 6.2 presents the four key areas where a decision has to be made when choosing a mixed method design and possible options under each area.

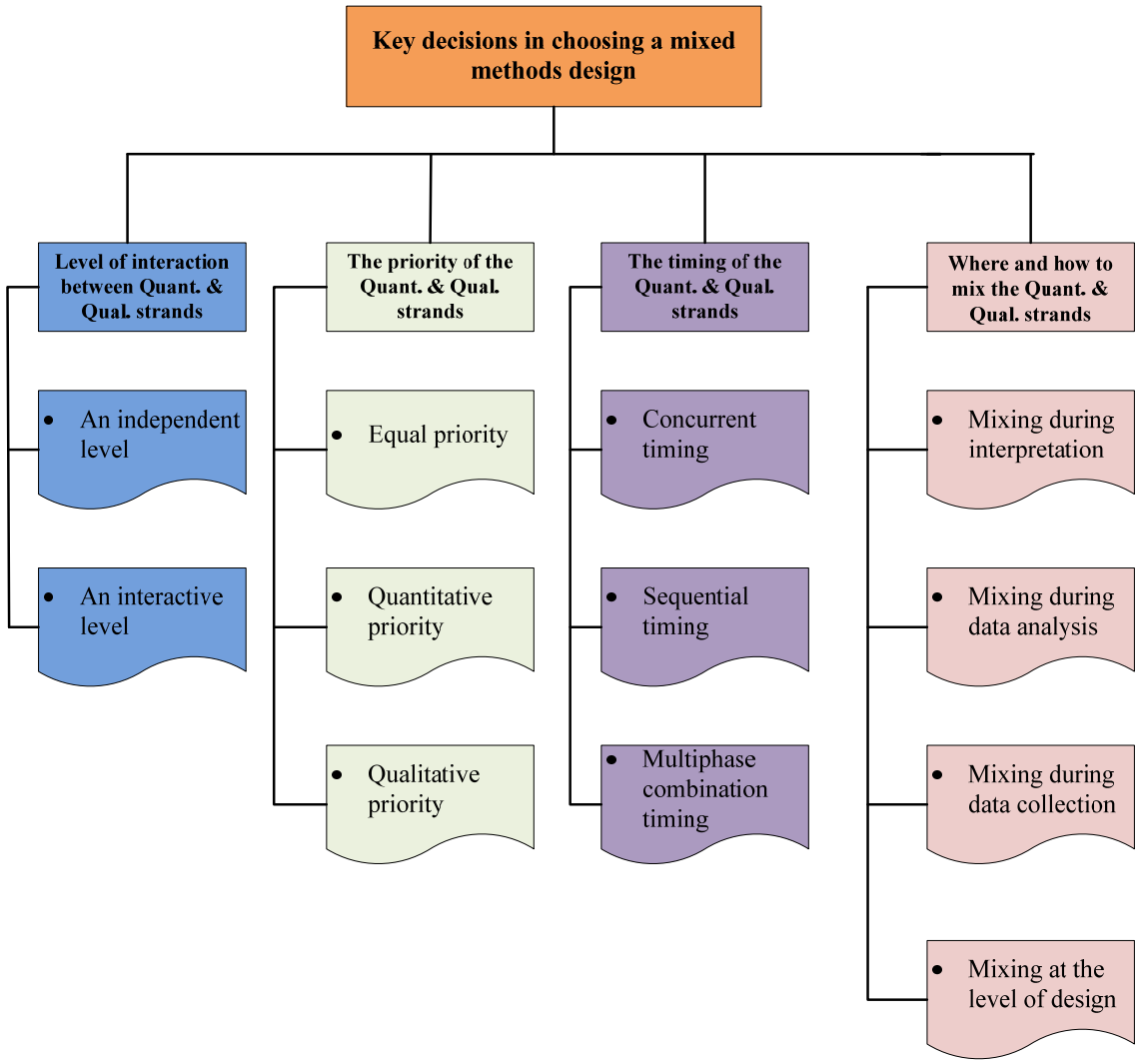

Figure 6.2 Key decision in choosing a mixed methods design

Source: Adapted from Creswell and Clark (2011), Designing and Conducting Mixed Methods Research.

With these decision points in mind, a mixed methods researcher then selects a design that incorporates interaction, priority, timing and mixing. Creswell and Clark (2011) presented the most commonly used mixed methods designs in practice as follows: (i) the convergent parallel design, (ii) the explanatory sequential design, (iii) the exploratory sequential design, (iv) the embedded design, (v) the transformative design and (vi) the multiphase design. They advised that researchers should carefully select a design that best matches the research problem and reasons for mixing, in order to make the study manageable and simple to implement. In line with all these discussions about the different research approaches, the need for a researcher to acknowledge the philosophical worldview he or she is bringing to a particular research is apparent, along with the need to identify the components of his or her worldview (i.e. *Ontology* - what is the nature of reality? *Epistemology* - what is the relationship between the researcher

and that being researched? *Axiology* - what is the role of values? *Methodology* - what is the process of research? And *Rhetoric* - what is the language of the research?). Moreover, there is also a need to state the reasons for the choice, and also to select a design that takes into cognisance all decision points presented previously. It is imperative at this juncture, therefore, to pinpoint the worldview that was adopted in this research and to establish what research design was used and the reasons for this choice; in other words, the research framework that was followed when conducting this research.

6.3 Selected Research Framework

The worldview chosen for this study, therefore, was drawn from the **Pragmatism worldview**, leading to the use of a **mixed methods research design**. Among the six commonly used designs, the **convergent/triangulation design** was employed for the course of the study. Many researchers in the past have employed this design using different nomenclature; for instance, Morse (1991) referred to it as 'simultaneous triangulation', Teshakkori and Teddlie (1998) called it 'parallel study', Cresswell (1999) called it the 'convergence model' and Creswell *et al.*. (2003) described it as 'concurrent triangulation'. Creswell and Clark (2011) argued that regardless of the name, the convergent design occurs when the researcher collects and analyses both quantitative and qualitative data during the same phase of the research process, then merges the two sets of results into an overall interpretation. Equal importance is given to both approaches when addressing the study's research questions. The two sets of data collected are analysed separately and independently using typical quantitative and qualitative analytical procedures. Once this is done, the next step is to merge the results of the two data sets and to interpret to what extent and in what ways the two sets of results converge or diverge from each other. Figure 6.3 shows the flowchart of research design and basic procedures employed in conducting the research. It must be mentioned here that the paradigm and the research design selected for this study are in tandem and are very much in line with the recommendations of Creswell and Clark (2011), who advised that instead of trying to mix different paradigms, especially when employing mixed methods, researchers who employ convergent design should work from a pragmatism paradigm in order to provide an umbrella paradigm to the research study.

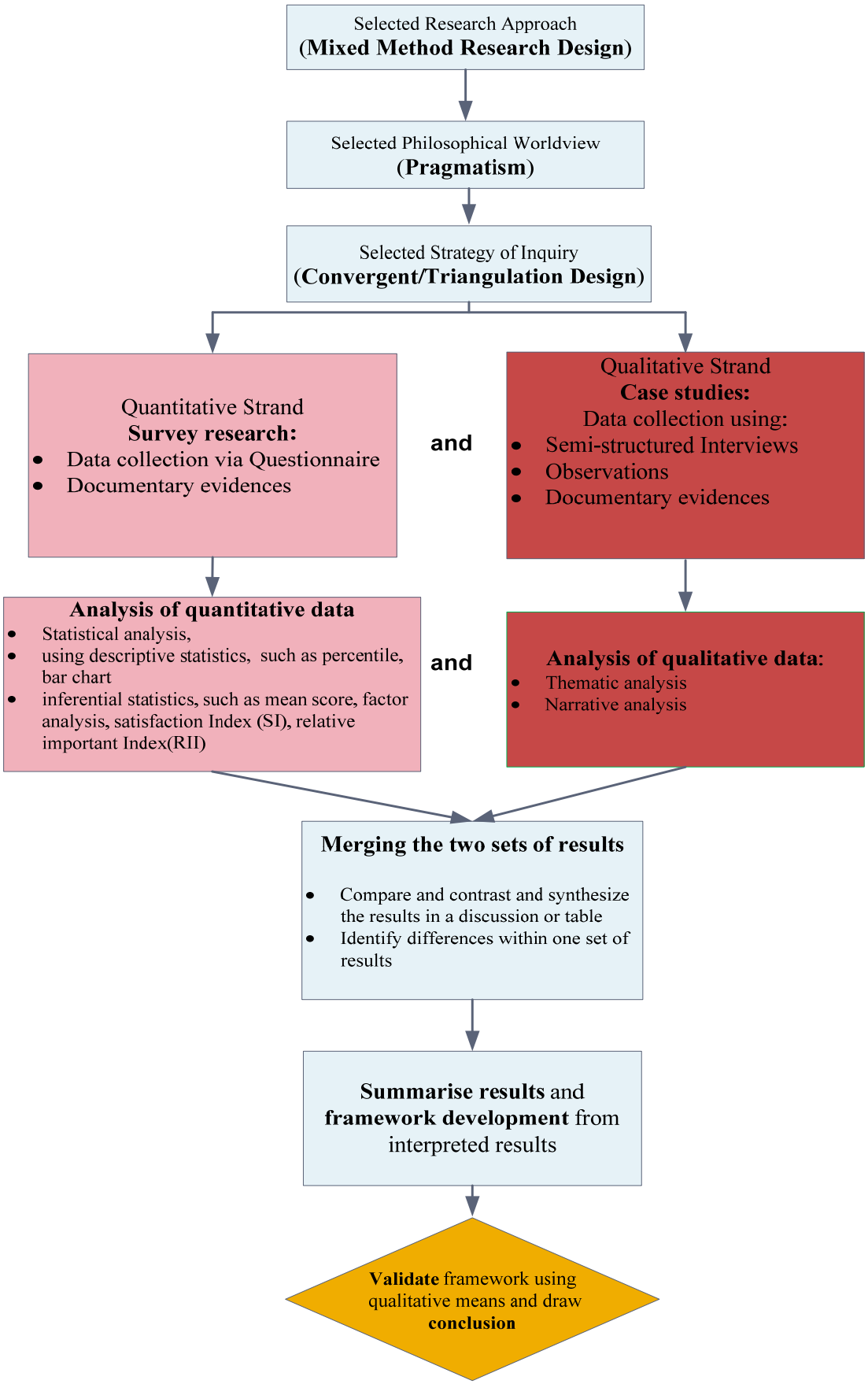

Figure 6.3: Flowchart of research design and basic procedures employed when conducting the research

6.3.1 Strengths and Weaknesses of Convergent Research Design

Although the convergent design was the first mixed methods design to be discussed in the literature (Jick, 1979 and Bryman, 2006), and the most popular approach for thinking about mixed methods research (Creswell and Clark, 2011), the design is not without its own strengths and weaknesses; these positives and negatives of the design are summarised in Table 6.3, as follows:

Table 6.3 Positives and negatives of convergent/triangulation design

Positives of convergent design	Negatives of convergent design
It is an efficient design, as both types of data are collected during one phase of the research at roughly the same time.	It requires much effort and expertise, particularly because of the concurrent data collection.
Ease of collecting and analysing each type of data separately and independently, which allows the involvement of individuals with expertise in both quantitative and qualitative techniques.	The problem of different samples and sample sizes may affect generalisation and in-depth description of the results.
The design makes intuitive sense. Researchers new to mixed methods often choose this design.	It can be challenging to merge two sets of very different data and their results in a meaningful way.
It is more flexible and reliable.	There is a problem of what to do if the quantitative and qualitative results do not agree.

6.4 Reasons for Choosing a Mixed Methods Research Approach.

Having selected a framework within which to conduct this study, it is important to provide the rationale for its choice. This is useful to further prove that an appropriate research approach has been followed during the conducting of this research and that there is no misfit of approach, i.e. a situation where one type of method is used when another would really be more advantageous. The reasons for qualitative and quantitative research approaches being mixed together in this study were informed by three major factors: (i) nature of the research questions, (ii) the researcher's experience, and (iii) the significance or purpose of the study. These three reasons will now be elaborated on in succession.

6.4.1 Nature of the Research Problem

A cursory look at the research questions for this study reveals a combination of "what" and "how" questions. For illustration, the main aim of the study is to develop a framework for managing risk in privately financed market projects in Nigeria. The study then set out to provide answers to the following pertinent questions:

- What are the risk factors in PPP projects in a developing economy?
- How are the identified risk factors allocated among the parties involved in PPP projects?
- What are the significant risk factors to each and every stakeholder in PPP market projects in a developing economy?
- What are the impacts of these critical risk factors on stakeholders' satisfaction of the market projects?
- What are the policy recommendations for mitigating these potential risk factors?

Looking at the first research question, this question is more of an exploratory question, seeking to establish the potential risk factors in PPP projects in Nigeria a developing economy. This type of research question, according to Yin (2009), is a justifiable rationale for conducting an exploratory study, the goal being to develop pertinent propositions for further enquiry. In addition, the last two questions also aim to identify the impact of these risk factors on stakeholders' satisfaction of PPP market projects and to provide possible policy recommendations for mitigating these potential risk factors.

However, Creswell (2009) opined that for social research problems which call for the identification of factors that influence an outcome, such as these, the quantitative approach is the best. From another perspective, Morse (1991) suggested that if a concept or phenomenon needs to be better understood because little research has been done on it, then it merits a qualitative approach. He further identified that a qualitative approach may be needed because the topic is new; it has never been addressed with a certain sample or group of people, and existing theories do not apply to the particular sample or group under study. Yin (2009) submitted that for an exploratory study, any of the five research methods (i.e. experiment, survey, archival analysis, history and case study) can be used. This implies that either the qualitative or the quantitative approach can be employed.

From the extant literature reviewed, it is evident that although the concept of risk and PPP is not a new concept in the construction industry generally or in developing

economy in particular, the concept of PPP is still new in Nigeria, especially in market development, where little or no work is available on risk factors that impact on the outcome of PPP market projects. Employing either a qualitative or quantitative approach alone will not provide the best understanding of these risk factors; the two approaches were therefore mixed together concurrently, as combining the methods should help annex the strength of both approaches and enable the best possible understanding.

Moreover, the other research questions are "how" questions, i.e. how the risk factors are allocated among parties to PPP market projects and how these risk factors impact on stakeholders' satisfaction. These types of questions are more explanatory and likely to lead to the use of case studies; therefore there is a need for mixed methods as there is methodological triangulation. This choice is in agreement with the assertion of other researchers who advanced arguments in support of method triangulation. Notable among their work is that of Love *et al.*. (2002), Yin (2009) and Creswell and Clark (2011).

6.4.2 Researcher's Personal Experience

Another important reason or consideration that informs the choice of mixed methods is the personal experience of the researcher on a particular PPP market project in the study area. This was actually responsible for the interest of the researcher in this area. Moreover, since, risk and PPP are new concepts in Nigeria, the researcher understands that the vast majority of the respondents may not have an in-depth understanding of these concepts, and this will affect their responses. It is therefore important to equally corroborate the details supplied by those who have been involved in one or two such projects with general opinion, so as to gather a comprehensive overview of risk in PPP market projects.

Furthermore, although combining methods takes extra time because of the need to collect and analyse both quantitative and qualitative data, as the researcher enjoys both the structure of quantitative approach and the flexibility of qualitative enquiry this factor actually propels the researcher towards the choice of mixed methods.

6.4.3 Significance or Purpose of the Study

This study is an endeavour that will not only lead to the awarding of a higher degree but one which should also improve the performance of the construction industry, particularly in Nigeria and other developing economies, and will therefore inevitably help make the whole world a better place to live in. Therefore, such an endeavour requires diligence, commitment, and a lot of rigour for it to be valid and reliable. Furthermore, since the study is going to be assessed by field experts, the knowledge claims need to be valid and highly reliable. All these factors inform the decision to employ a mixed methods approach, which has been judged to be a useful tool when complementariness, completeness of ideas, credibility, and diversity of views which lead to reliability and validity are desired.

6.5 Quantitative Research Strand

Having described the strategy of enquiry selected for the study and the reasons for this choice, the next step is to describe the procedures followed while conducting the research, as dictated by the strategy of enquiry adopted. The first strand to be discussed is the quantitative strand. According to Teddlie and Tashakkori (2009), a strand is a component of a study that encompasses the basic process of conducting quantitative or qualitative research; it entails the process of collecting data, analysing and interpreting results based on the data collected. Therefore, each of the research strands will be discussed in turn using the three components, i.e. the process of data collection, data analysis and interpretation.

6.5.1 Data Collection under the Quantitative Research Strand

The purpose of data collection in mixed methods research is to develop answers to the research questions (Teddlie and Yu, 2007). For data collection under the quantitative strand of the research, due to the uniqueness of the required data, the possibility of obtaining unbiased information from the populations of interest for this study, and the fact that the data collected will be used to complement data from other sources, a survey research method was employed in this study, as can be seen in Figure 6.3. Survey research provides a quantitative or numeric description of the trends, attitudes or opinions of a population by studying a sample of that population (Creswell, 2009). It includes cross-sectional and longitudinal studies using questionnaires, reviews of archival data or structured interviews for data collection, with the intent of generalising from a sample to a population (Babbie, 1990).

To collect data using the survey method in the quantitative strand for this study, a questionnaire survey and review of archival materials was employed. The questionnaire yielded primary data, while the review of archival materials provided secondary data. Questionnaires, according to Blaxter, Hughes and Tight (2001), are one of the most widely used social research techniques. Questionnaires involve the researcher formulating precise written questions for the respondents, whose opinions or experiences the researcher is interested in. Although this seems such an obvious strategy for finding the answers to the issues that interest a researcher, Blaxter *et al.*. (2001) warned that it is not such a simple task as it might seem. This therefore calls for special care in the design as well as the administration.

Blaxter *et al.*. (2001) identified three different ways through which questionnaires could be administered, as follows: (i) they could be sent by post to the intended respondents (postal questionnaire survey), (ii) they could be administered either personally or by field assistants over the telephone or face-to-face, and (iii) they could be administered over the internet. They further asserted that each of these methods has advantages and disadvantages. For instance, face-to-face surveys may get a better response rate, but are more time consuming for the researcher. Postal and email surveys, conversely, are likely to have lower response rates and possibly poorer answers because the respondent has no one available to answer any queries, but they may allow a larger number of people to be surveyed.

6.5.1.1 Design and Content of the Questionnaire

For a good response rate, whatever means a researcher wishes to employ in the administration of the questionnaires, when designing and wording questionnaires it is necessary to keep the respondents in mind, in terms of their time, level of understanding of the concept and the importance of the survey. In practice, just as questionnaires can be administered using different means, there is a variety of ways in which questions can be asked. Fellows and Liu (2008) opined that questions can be posed in two primary forms - open or closed. Open questions are designed to enable the respondent to answer in full; to reply in whatever form. While these are easy to ask, they may be difficult to answer; the answer may never be fully comprehensive and the answers are often very difficult to analyse. Closed questions on the other hand have a set number of responses, as determined by the researcher. However, Fellows and Liu (2008) suggested that such

rigidity in the available responses may constrain the responses artificially; hence a response option of "other, please specify" should be provided wherever possible.

Blaxter *et al.*. (2001) provided useful hints on how to word questions in a questionnaire as well as on its layout and presentation. These hints were very helpful in the design of the questionnaire for this study. For example, in terms of the layout of a questionnaire, they suggested that questionnaires should be clearly typed and attractively laid out using a legible type size. Moreover, they stressed the need to open the questionnaire with a brief introduction about the researcher and the study as well as a contact address. In addition, since sensitive questions will always be asked in the questionnaire, they advised that the researcher should start by assuring respondents of the confidentiality of their individual responses. Additionally, in the wording of the questions, Blaxter *et al.* (ibid) suggested that the researcher should avoid too many questions that are couched in negative terms, although in some cases, such as when a series of attitude-based questions are being asked, it can be useful to mix positive and negative questions. Fellows and Liu (2008) added that the questions should be precise, unambiguous and easy for respondents to answer, and that they should not require extensive data-gathering by the respondents.

Furthermore, Blaxter *et al.* (2001) also cautioned about questionnaire length. According to them, it is desirable that the length of the questionnaire is kept within reasonable limits, but simultaneously it is better to space questions well so that the questionnaire does not appear cramped. From another perspective, Forsgren (1986) emphasised that business manager's work under rigid constraints and any attempt to distract them from their business is likely to be viewed as an intrusion into their time, and therefore risks being resented. The need thus arises to keep the length of the questionnaire as reasonable as possible so that the respondents do not lose interest in it. All these and many more suggestions from other writers were taken into consideration for the design of the questionnaire for this study; thus conscious efforts were made to keep the length of the questionnaire as short as practicable while making it comprehensive enough to be able to capture the data necessary to realise the research objectives. For example, the questionnaire has to be split into three different sets based on the different categories of respondents, i.e. separate questionnaires for general respondents, traders, and shoppers at the market (see appendices A-C for the questionnaire).

In line with the research objectives, the general questionnaire was divided into two different sections. The first covers demographic information about the respondents; this includes the respondents' academic and professional qualifications, construction experience, designations, number and type of projects they have handled, their roles in the project and their experience in PPP projects. These pieces of information will help the researcher to understand how knowledgeable the respondents are on the issue of PPP projects, which will inevitably determine the suitability and validity of information gathered from them. As the saying goes, "*you cannot give to others what you don't have*".

In the second section of the questionnaire, the respondents were requested to give their opinions on issues such as types of PPP models they have used before, the perceived benefits of PPPs, their awareness of different risk identification and analysis techniques, and the party that is supposed to perform these roles among parties to PPP arrangement. Moreover, from extant literature, 68 risk factors were identified as being potential risks that can affect the outcome of any PPP project. These were sub-divided into two main categories: endogenous and exogenous risk, these classifications being adopted from the work of Ibrahim *et al.*. (2006). Respondents were then asked to provide opinions regarding the likelihood/probability of each factor occurring and the likely impact should they occur. They were to score their opinions on a five-point Likert scale. The Likert scale, according to Leming (1997) as cited by Odeyinka (2003), is the most widely used method of scaling in social sciences. Odeyinka (2003) opined that the Likert scale is possibly the most popular scale due to a number of advantages, such as being easy to construct and manage in terms of administering. Quoting Trochim (2002), Odeyinka asserted that the Likert scale has clear and understandable instructions for the respondent, which makes it possible for the scale to be used in telephone or mail surveys as well as in interviews with children. The Likert scale has been used extensively in the literature by many researchers in both general construction management research and PPP studies, e.g. Akintoye (2000), Dey and Ogunlana (2004), Soetanto *et al.* (2004), Long *et al.* (2004), Li *et al.* (2005), Zhang (2005), Ibrahim *et al.*. (2006), Roumboutsos and Anagnostopoulos (2008) and Ke *et al.* (2010), to mention a few. Furthermore, in the second section of the general questionnaire, the respondents were also asked to indicate their opinions on the effectiveness of the identified risk mitigation measures using their experience of PPP market projects. This section of the

questionnaire also elicited from the respondents other possible mitigation measures they felt could be applied to mitigate or reduce the impact of the identified risk factors.

In the same vein, the other sets of questionnaires (i.e. a set to the traders and another to the shoppers) were divided into two sections. The first touched on respondents' satisfaction levels with the market facilities before and when it was redeveloped using the PPP arrangement and the second section elicited general background information about the respondent. For instance, they were asked to indicate how long they had been using the market, the reasons for their choice and also to give possible suggestions on how best the developer could improve their satisfaction levels in future developments.

6.5.1.2 Questionnaire Administration

Having taken every precautionary measure to see that the questionnaires are designed and worded appropriately with a view to achieving a good response rate, the next step is the administration of the questionnaires. But before administering these, decisions had to be made about who among the population would be selected as a sample to receive and complete the questionnaires. As mentioned previously, this study involves a mixed methodology, i.e. quantitative and qualitative methods; thus it was necessary to decide who would be selected as a sample for the two stands, as well as the size of the sample for each of the strands. Creswell and Clark (2011) affirmed that there are two main options for selecting individuals to participate in the quantitative and qualitative strands of a convergent study like this: (i) using the same individuals as samples for the two strands, or (ii) using different individuals as samples for each strand. Here different individuals were used for the quantitative and qualitative strands. it is therefore necessary to discuss the sampling techniques employed for each strand.

6.5.1.2.1 Sampling Techniques Employed for the Quantitative Strand

Marshall (1996) stated that choosing a study sample is an important step in any research project, since it is rarely practical, efficient or ethical to study whole populations. However, Fellows and Liu (2008) argued that if the population is sufficiently small, a full population sample may be possible. According to Fellows and Liu (ibid), the objective of sampling is to provide a practical means of enabling data collection and processing components of the research to be carried out, whilst ensuring that the sample provides a good representation of the population. Eisenhardt (1989) stressed that because populations define the set of entities from which the research sample is drawn,

the concept of population in quantitative research is critical. It is imperative, therefore, to first determine the population for the study and then the size of the sample, i.e. the optimum number necessary to enable valid inferences to be made about the population.

Since the PPP arrangement includes the collaboration between public and private entities, the total population for this study therefore included all registered contractors, quantity surveyors, architects, engineers, finance houses, banks, private individuals and clients within the study area. The list of all professionals who are registered and practising within the study area could be obtained from the respective institution of each profession, e.g. Nigerian Institute of Quantity Surveyors,(NIQS), Nigerian Institute of Architects (NIA), Bankers, Nigerian Society of Engineers (NSE) etc. A list of registered contractors working within the study area could also be sourced from the Federation of Construction Industry (FOCI), which is the registration body for contractors in Nigeria, but there is no database from which to source those who have been involved in PPP projects, nor is there a list of private entities that have been involved in PPP projects. Thus in order to ensure a homogenous sample, using random or probability sampling techniques was not feasible in this study. The study therefore made use of the purposeful/judgement sampling technique coupled with the snowball technique.

According to Marshall (1996), the judgement sampling technique is the most common sampling technique, wherein the researcher actively selects the most productive sample to answer the research question. Marshall (ibid) stated that the judgement/purposeful sampling technique can involve developing a framework of the variables that might influence an individual's contribution and will be based on the researcher's practical knowledge of the research area, the available literature and evidence from the study itself. Based on this, the sample frame for this study was then chosen to be those professionals and other individuals who had been involved in one or two PPP projects within the study area. Although there is no official document stipulating the number of professionals that have been involved in PPP projects within the study area, with the researcher's knowledge of the study area, coupled with the help of colleagues and postgraduate diploma students from the Federal University of Technology, Akure, who were working within the study area, 25 ongoing and completed PPP projects were identified within the study area, ranging from airports to housing, road, school and market constructions. People who were involved in these projects were contacted directly, and were of equally great assistance because they also directed the researcher

and the research assistants to others with whom they had worked on PPP projects in the past (the snowballing system).

A total of 268 questionnaires were distributed to various categories of respondents within the study area, as shown in Table 6.4. Out of this number of questionnaires distributed, 124 were returned. This represents a response rate of 46%, which is way above the usual response rate of 20-30% for questionnaire surveys in construction management studies, as suggested by Akintoye and Fitzgerald (2000) and Fellow and Liu (2008). However, only 93 of the 124 questionnaires returned were found to be fit for analysis. This represents around a 35% response rate as a proportion of the 268 that were distributed. The distribution and responses are depicted in Table 6.5. From Tables 6.4 and 6.5, it is evident that the highest number of questionnaires were distributed to, and the greatest proportion returned and suitable for analysis from, Lagos State; this is due to the fact that at present, a great number of PPP projects are occurring in Lagos and a larger proportion of companies that have PPP projects within the zone have their head office in Lagos.

Table 6.4: Questionnaire distribution within the study area (i.e. south-western zone of Nigeria)

Distribution within state	Number distributed	Percentage (%)
Lagos	120	45
Oyo	40	15
Ogun	21	8
Ondo	35	13
Osun	33	12
Ekiti	19	7
Total	**268**	**100**

Table 6.5: Breakdown of the 93 questionnaires found suitable for analysis.

Respondents	Lagos	Oyo	Ogun	Ondo	Osun	Ekiti	Total
Architects	13	1	3	2	2	3	**24**
Structural Engineers	4	2	1	3	1	-	**11**
Quantity Surveyors	21	2	2	7	2	2	**36**
Professional Builders	3	2	1	4	2	1	**13**
Bankers	2	1	-	1	1	-	**5**
Facilities Managers	3	-	-	1	-	-	**4**
Total	**46**	**8**	**7**	**18**	**8**	**6**	**93**

Moreover, in the quest to evaluate the levels of satisfaction of the end-users (i.e. the shoppers, traders and other stakeholders), the other two sets of questionnaires were administered to traders and shoppers in the market. Documentary records were also reviewed. A total of 54 traders and 82 shoppers completed the questionnaires. During visits to the PPP markets under study, the majority of the stalls were still unoccupied, although the researcher was informed that they had been let to traders who had not yet moved in.

6.5.1.2.2 Piloting and Administration of Questionnaires

Before a choice of how best to get the questionnaires across to the respondents was made, it was decided to follow the advice of Fellows and Liu (2008), who suggested that questionnaires should initially be piloted, i.e. completed by a small sample of respondents. According to them, piloting tests whether the questions are intelligible, easy to answer and unambiguous, as well as providing an opportunity to improve the questionnaire and determining the time required to complete the exercise. Fellows and Liu (2008) further argued that an important aspect of piloting, which is often overlooked, is that it can help establish whether the data yielded by the questionnaire (or other data collection instrument) is suitable for analysis (as intended), and via the analysis, is adequate to give results which facilitate the realisation of the research objectives. After a series of useful corrections and discussions about the questionnaire between the researcher and the supervisors, the questionnaires were then piloted among colleagues in Herriot-Watt University who are Nigerians in the field of construction management. The pilot questionnaires were additionally sent by post to colleagues in the Federal University of Technology, Akure, as well as professionals in Akure for their

comments. Supervisors' input, as well as the results from the pilot, was used to refine the questionnaire before the questionnaires were administered fully.

The administration of the questionnaires, especially those meant for the traders and shoppers, was done face-to-face by the researcher during visits to the markets. In addition, two research assistants were involved in assisting in the administration of the questionnaires to the shoppers and traders at the markets. The general questionnaires were administered to professionals who had experience in PPP projects within the study area (south-western zone of the country) through the help of the undergraduate and postgraduate diploma final year students of the Department of Quantity Surveying at the Federal University of Technology, Akure, and professional colleagues working in the area. Other sets were administered via email directly to respondents whom the researcher had worked with previously, along with the researcher's students who were working in the study area.

Finally, in addition to the questionnaire survey, secondary data was also collected through a purposeful review of sources such as media documents (e.g. newspapers and magazines) and other surveys by the Nigerian government, as well as international organisations such as the World Bank (WB) and the Organisation for Economic Co-operation and Development (OECD). The intention was to confirm the opinion of respondents, especially in the area of the PPP projects' performance, concession period, parties to the agreement and the satisfaction of the end-users.

6.5.1.2.2 Validity and Reliability Test

Another component of all good research is the utilisation of procedures to ensure the validity and the reliability of the data, results and their interpretation (Creswell and Clark, 2011). Yin (2009) identified four tests that have been commonly used to establish the quality of empirical social research in this way as follows: (i) construct validity, (ii) internal validity, (iii) external validity, and (iv) reliability. According to Yin (2009), construct validity involves identifying correct operational measures for the concepts being studied. Internal validity entails seeking to establish a causal relationship whereby certain conditions are believed to lead to other conditions, as distinguished from spurious relationships; Yin (ibid) further argued that this is only necessary for explanatory or causal studies but is not required for descriptive or exploratory studies like this study. External validity, on the other hand, involves defining the domain in which a study's findings can be generalised. Yin (ibid) concluded that reliability aims to

demonstrate that the operations of a study, such as the data collection procedures, can be repeated with the same result.

In the words of Trochim (2002), the validity of a measuring instrument could be ensured by piloting a questionnaire before administering it to respondents in a real survey. Therefore, the piloting of the questionnaires described above ensured the validity of the research instrument used under this strand of the study. In terms of reliability, Field (2005) explained that one way to think about it is that, all things being equal, a person should get the same score on a questionnaire if they complete it at two different points in time. He discussed the use and problems of the split-half reliability method and concurred with Nurosis (1992) that one of the most commonly used reliability coefficients is Cronbach's alpha (α), which was named after Cronbach who came up with a measure in 1951 that is loosely equivalent to splitting data in two in every possible way and computing the correlation coefficient for each split (Field, 2005). Cronbach's alpha (α) can be computed using the following formula:

$$\alpha = \frac{N^2 \overline{Cov}}{\sum s^2_{item} + \sum Cov_{item}} \quad \text{..... 6.1}$$

Where N is the number of items in the scale, $\overline{cov}$ is the average covariance between items, and $\sum s^2_{item}$ is the sum of variance of the items and $\sum Cov_{item}$ is the sum of items covariance.

According to Field (2005), the top half of the equation is simply the number of items (N) squared, multiplied by the average covariance between items (i.e. the average of the off-diagonal elements in the variance–covariance matrix). The bottom half is the sum of all the item variances and item covariance (i.e. the sum of everything in the variance–covariance matrix). Field (ibid) further explained that there is a standardised version of the coefficient, which essentially uses the same equation except that correlations are used rather than covariances, and the bottom half of the equation uses the sum of the elements in the correlation matrix of items. He suggested that normal α is appropriate when items on a scale are summed to produce a single score for that scale (the standardised α is not appropriate in these cases). The standardised α is useful, however, when items on a scale are standardised before being summed. Using the PASW STATISTICS 18 software, the Cronbach's α was computed to test the reliability of the

five-point Likert scale. Results obtained for the different measuring scales used are shown in Table 6.6.

Table 6.6: Reliability Coefficients for the Measuring Scales

Scale of Measure	Cronbach's α
Frequency of use of different PPP models	0.901
Perceived benefits of private participation in infrastructure development	0.830
Probability of occurrence of identified risk factors	0.914
Impact of identified risks on project delivery	0.960
Effectiveness of risk mitigation measures	0.924
Satisfaction of end-users with the new shopping facility	0.865
Comparison between users' satisfaction with the new market and the old market facility	0.709

Many writers who have interpreted the reliability of scales of measures using Cronbach's α value, such as Nurosis (1992), Kline (1999) and Field (2005), concur that a value of 0.7–0.8 is an acceptable value for Cronbach's α, and that values substantially lower indicate an unreliable scale. Nurosis (1992) even suggested that the degree of reliability of any instruments is more perfect as they tend towards 1.0. From the result of the reliability test performed on the scale used in the questionnaires for this study, as presented in Table 6.6, it is evident that the smallest Cronbach's α value for those scales is 0.709, and the biggest is 0.960. Therefore, it can be concluded that the instruments used for this study are significantly reliable.

6.5.2 Data Analysis under Quantitative Research Strand

In order to facilitate the ease of communicating the results while at the same time improving their validity, multiple analytical techniques were employed in this study. This is in line with the assertion of Ajayi (1990), who argued that multiple analytical techniques could assist data analysis in this way. Hence, both descriptive and inferential statistics were employed for the study. The descriptive statistics involved the analysis of uni-variants such as charts, percentiles, measures of central tendency etc.; these were used to analyse demographic information about the respondents. Tools like mean scores, Kruskal-Wallis tests, analysis of variance (ANOVA) and factor analysis were employed for the inferential statistics. These are discussed in turn as follows:

6.5.2.1 Mean Score

This technique was employed for the analysis of different aspects of this study. For instance, the mean score was used to analyse the opinions of the respondents of the frequency of use of different PPP models, the perceived benefits of PPP schemes, the probability of occurrence, impact of identified risk factors and risk allocation preference of the respondents. Moreover, the effectiveness of identified risk mitigation measures was also evaluated using the mean score. What, then, is this mean score and how is it calculated? Under the mean score analytical technique, factors are assigned numerical

$$\text{Mean Score} = \frac{5n_5 + 4n_4 + 3n_3 + 2n_2 + 1n_1}{n_5 + n_4 + n_3 + n_2 + n_1} \quad \text{..... .... 6.2}$$

values based on the respondents' ratings of factors, e.g. extremely significant = 5 points, very significant = 4 points etc, while the very least significant is scored as 1 point. Then the mean score (MS) for each factor is calculated using this equation:

where: n_1 = number of respondents who answered "not likely", "negligible impact" or "not effective"

n_2 = number of respondents who answered "slightly likely", "marginal impact" or "slightly effective"

n_3 = number of respondents who answered "somehow likely", "substantial impact" or "somehow effective"

n_4 = number of respondents who answered "likely", "severe impact" or "effective"

n_5 = number of respondents who answered "very likely", "disastrous impact" or "very effective"

6.5.2.2 Kruskal-Wallis Test

The Kruskal-Wallis test is a non-parametric test that is very similar to the Mann-Whitney U test. Like the Mann-Whitney U test, the Kruskal-Wallis test is based on ranked data and is very useful when dealing with non-normally-distributed data. The test is used to test for differences between several independent groups (Field, 2005). According to Field (ibid), to begin with, the scores are first ordered from the lowest to

the highest, ignoring the group to which the score belongs, and then the lowest score is assigned a rank of 1, the next highest a rank of 2 and so on. After this the scores are returned to their groups and the ranks for each group are simply added up. The sum of ranks for each group is denoted by R_i (where $_i$ is used to denote the particular group). Once the sum of ranks has been calculated for each group, the test statistic K is calculated as in Equation 6.3. Here the Kruskal-Wallis test was conducted to determine whether the mean significance of each factor was equal across the public, private consultants and contractors using the Statistical Package for the Social Sciences (PASW STATISTICS 18) software. This test statistic has a special kind of distribution known as the chi-square distribution, and for this distribution there is one value for the degree of freedom, which is one less than the numbers of groups; in this case 4.

$$K = 12/N(N+1)\sum_{i=1}^{k}\frac{R_i^2}{n_i} - 3(N+1) \quad \text{.....} \quad 6.3$$

where R_i is the sum of ranks for each group, N is the total sample size and n_i is the sample size of groups 1, 2, 3 and 4 respectively.

6.5.2.3 Analysis of Variance (ANOVA)

ANOVA is based on the F-test statistical method, which is the ratio of the variance among conditions (between-groups variance) to the variance within conditions (within-groups, or error variance) (Fellows and Liu, 2008). This test is very useful both in experimental research and in non-experimental research like this. According to Fellows and Liu (ibid), in non-experimental studies, participants are not randomly assigned to groups but are categorised into naturally occurring groups; for instance, in this study, participants consisted of consultants, contractors, clients, sponsors etc. A t-test or ANOVA is then used to analyse the differences among the means of these groups.

H_0: $\mu_1 = \mu_2 = \ldots\ldots = \mu_n$

H_1: $\mu_1 \neq \mu_2 \neq \ldots\ldots\ldots\ldots \neq \mu_n$

This method assumes that each sample is drawn from a normal population; each population has the same variance.

$$F = \frac{\text{between groups estimated variance}}{\text{Within groups estimated variance}}$$

Sample variance: $S^2 = \dfrac{\sum(x-\bar{x})^2}{n-1}$ 6.4

Variance among sample means:

$$S\frac{2}{x} = \frac{\sum(\bar{x} - \bar{\bar{x}})^2}{k-1} \quad \text{.....6.5}$$

where: $\bar{\bar{x}}$ is the ground mean (i.e. the arithmetic mean of all the values of the samples)

K is the number of samples

As the standard error of the mean $\sigma_{\bar{x}}$ is $\sigma/\sqrt{n}$, Levin and Rubin (1990) showed that in the first estimate of the population variance, between groups variance is:

$$\sigma^2 = \frac{\sum n_j (\bar{x}_j - \bar{x})^2}{k-1} \quad \text{..... 6.6}$$

where: n_j = the number of items in j.

The within group variance:

$$\text{Sample variance } S^2 = \frac{\sum(x - \bar{x})^2}{n-1} \quad \text{.....6.7}$$

In the second estimate of the population variance, the within group variance is:

$$\sigma^2 = \sum\left(\frac{n_j - 1}{n_T - k}\right)S_j^2 \quad \text{.....6.8}$$

where $n_T = \sum n_j$

As $F \rightarrow 1$, the likelihood that H_0 is valid increases; as the value F increases, the likelihood of H_0 being valid decreases.

Degrees of freedom in the numerator: (k-1)

Degrees of freedom in the denominator: (n_j-k)

Using tables of the F distribution and the appropriate degrees of freedom; if $F_{calc} < F_{tab,}$ the null hypothesis should not be rejected.

In this study, PASW STATISTICS 18 software was employed through the discriminate analysis procedure of the package to carry out the ANOVA test. In addition to the F statistic, produced, the procedure also calculated the levels of significance (P-values).

This enabled statistically significant differences between groups to be determined at a significance level of 5%. As a pre-condition for the F-test to be valid, Fellows and Liu (2008), quoting Yeomans (1968), asserted that the test needs to be applied to large samples only, say n ≥100. However, in the literature, reviewed, Akintoye (2000) and Ibrahim *et al.* (2006) successfully applied the technique to analyse data from 84 and 36 respondents, respectively, which constituted less than the sample of 100 suggested. According to these researchers, this was a result of the low response to surveys in the construction industry, which made large samples from within the construction industry unrealistic. The test was thus employed in this study with a sample of 93 people, which according to Akintoye's (2000) assertion can be said to be adequate. ANOVA was therefore used to test the null hypothesis that the mean of individual risk factors is equal in all the groups.

6.5.2.4 Factor Analysis

DeCoster (1998) defined factor analysis as a collection of methods used to examine how underlying constructs influence responses in relation to the variables measured. He further explained that there are two types of factor analysis: exploratory and confirmatory. Exploratory factor analysis (EFA) attempts to establish the nature of the constructs influencing a set of responses, while confirmatory factor analysis (CFA) tests whether a specified set of constructs is influencing responses in a predicted way (DeCoster, 1998). He asserted that both types of factor analysis are based on the *Common Factor Model.* The principal component analysis (PCA) for factor extraction was used in this study. Field (2005) claimed that PCA is concerned only with establishing which linear components exist within the data and how a particular variable might contribute to that component.

The purpose of PCA in this study is to derive or explore a relatively small number of risk factors that can be used to represent relationships among the 68 risk factors identified in the literature, which are going to be included in the framework and represent the significant risk factors to watch out for in proposed PPP market projects. See Figure 6.4 for illustration of the PCA model, adopted from DeCoster (1998). According to Field (2005), PCA works in a very similar way to discriminant function analysis; the process begins with a matrix representing the relationship between variables. The linear components, i.e. factors of that matrix, are then calculated by determining the Eigen values of the matrix. These Eigen values are used to calculate eigenvectors, the elements of which provide the loading of a particular variable on a

particular factor. The Eigen value is also a measure of the substantive importance of the eigenvector with which it is associated (Field, 2005).

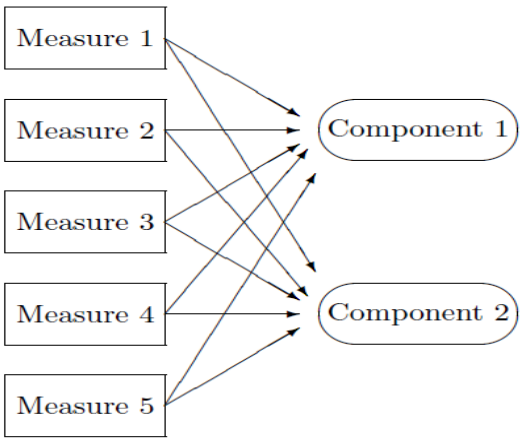

Figure 6.4: The model for principal component analysis.
Source: Adapted from DeCoster (1998) Overview of Factor Analysis.

Fellows and Liu (2008) argued that since the distinctive characteristic of PCA is its data-reduction capacity, it must determine the number of factors to be retained. While quoting Kaiser (1958) they further opined that one method of determining the number of retained factors is to exclude factors with variances of less than one (1). The rationale for this is that any factor should account for more variance than any single variable in the standardised test score space. Cattell (1966) proposed the "Scree test" as another approach where the Eigen values of each component are plotted against their associated component. The scree plot helps to identify the number of factors to be retained by looking for a relatively large interval between Eigen values. The rationale for the scree test, according to Fellows and Liu (2008), is that since the principal component solution extracts factors in successive orders of magnitude, the substantive factors appear before the numerous trivial factors which have small Eigen values and account for a small proportion of the total variance.

However, Dillon and Goldstein (1984) mentioned two complications of the scree test. First, there might be no obvious break, in which case the scree test is inconclusive. Second, in an instance where there are several breaks, it would be difficult to decide which break reflected the more appropriate number of factors. Moreover, for meaningful interpretation of factors generated by PCA, factor loading of 0.30 was used as a cut-off for significance (meaning that variables with factor loadings of less than 0.30 are not included in the factor).

Fellows and Liu (2008) suggested that for ease of interpretation of the factor extraction, the principal component matrix needs to be rotated. They identified that although there are several rotation methods available in PASW STATISTICS 18, the more common ones are v*arimax* and *oblimin*. Dillon and Goldstein (1984) asserted that the varimax method is most popularly used to rotate principal component solutions. In simple terms, Fellows and Liu (2008) affirmed that the procedure seeks to rotate factors so that the variation of the squared factor loadings for a given factor is enlarged to allow ease of interpretation based on the significance of the loadings.

Various tests are required to determine the appropriateness of the factor analysis for the factor extraction, including the Kaiser-Meyer-Olkin (KMO) measure of sampling accuracy, anti-image correlation, measure of sampling activities (MSA) and Barlett test of sphericity, which tests the hypothesis that the correlation matrix is an identity matrix (Fellows and Liu, 2008). In carrying out all these analyses and tests, PASW STATISTICS 18 was used. This package is the latest version of SPSS. Extant literature reveals that Akintoye (2000) used PCA to analyse factors influencing project estimating practices in the UK, thereby confirming the suitability of the technique for achieving the goals of this type of study.

6.6 Qualitative Research Strand.

As shown in the flowchart for the research design and procedure used when conducting the research, in Figure 6.3, the second strand of the research approach employed in this study was the qualitative strand. Distinguishing between the various research methods, Yin (2009) asserted that the more appropriate method for a particular purpose will be the one that is more inclusive and pluralistic. He argued that although it is possible to employ every research method for any of the three research roles (exploratory, descriptive and explanatory), the important conditions needing consideration in the choice of which type to use are the three conditions previously discussed in the section on the reasons for the choice of mixed methods approach (i.e. the type of research question posed, the extent of control an investigator has over actual behavioural events/personal experience of the researcher, and the audience/purpose of the study).

6. 6. 1 Case Study Research Strategy

With all these in mind, a case study research strategy was employed under this strand. This choice is in line with Barkley (2006)'s assertions that a case study is best suited to considering the "*how*" and "*why*" questions, or when the investigator has little control

over events. A case study, according to Yin (2009), is an empirical enquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between the phenomenon and the context are not clearly evident. By design, case studies usually take as their principal subject selected examples of a social entity within its normal context. Here, markets developed using PPP arrangement are the principal subject. At the simplest level, the case study provides descriptive accounts of one or more cases, which can also be used in an intellectually rigorous manner to achieve experimental isolation of one or more selected social factors within a real-life context.

Moreover, a case study, like any other research method, can be exploratory, descriptive and explanatory in nature. The goal of this study is to examine market development where PPP has been employed and the characteristics of risk as it affects these market developments in the context of Nigeria, with a view to identifying potential explanations for their successes or failures and suggesting how those risk events that affect the performance of PPP could be adequately managed. This study therefore employs an exploratory case study that is based upon the use of multiple sources of evidence (data triangulation), and studies multiple cases. It must be mentioned that the choice of an exploratory type of case study was due to the fact that little information is available on the concept of risk management in PPP projects in Nigeria, as relatively little research has been conducted in the area of risk management in PPP market projects in the country, and the PPP concept is still very new here, especially in the area of market development.

Therefore, in this section, having defined case studies and explored the different forms they can take, a discussion on the prejudices against the case study method, principal types of case study design and the value of case studies as a useful research methodology are presented. Moreover, due to the fact that the case study method, like any other research method, has its limitations and that misapplication of this method can produce incorrect or inconsistent findings, systematic steps taken in the design of the exploratory case study employed in this study are discussed so as to avoid and overcome the common pitfalls of the research strategy.

6. 6. 2 Types of Case Study Research Design

Barkley (2006) asserted that there are four different types of case study research design, divided into principal classifications; first, based on the number of cases in the research design (single-case vs. multiple-case) and secondly, based on the number of units of

analysis within each case (holistic vs. embedded). Yin (2009) contended that in some fields, such as political science and public administration, research has used different terms to differentiate between the different types of case study design. He opined that single- and multiple-case studies are in reality just two variants of case study designs. According to Barkley (2006), the choice between single-case and multiple-case designs for case study research is a function of the principal goal of the research, the availability of relevant cases, and the research budget. Yin (2009) identified five rationales for the choice of single-case, as follows: (i) when a single case represents the *critical case* in testing a well-formulated theory, (ii) where the case represents an *extreme* case or a *unique* case, (iii) where a single case is the representative or typical case. Here, the objective is to capture the circumstances and conditions of an everyday or commonplace situation, (iv) when a single case is the *revelatory* case, and (v) where a single case is the *longitudinal* case. According to Yin (2009), a potential vulnerability of the single-case design is that a case may later turn out not to be the case it was thought to be at the outset.

Multiple case studies on the hand are generally preferred if the research goal is program evaluation or the examination of causal relationships (hypothesis testing). The multiple-case design permits the researcher to make generalisations based on the observations of patterns or replication among the cases (Barkley, 2006). Yin (2009), quoting Herriott and Firestone (1983), asserted that multiple-case designs have distinct advantages and disadvantages compared to single-case designs, in that the evidence from the former is often considered more compelling, and the overall study is regarded as being more robust than with the latter. Yin (2009) stated that the replication logic in multiple-case study is analogous to that used in multiple experiments; therefore each case needs to be carefully selected so that it either (a) predicts similar results (as in literal replication), or (b) predicts contrasting results but for anticipatable reasons (a theoretical replication). In this study, a multiple-case study design was used. Three markets were selected for the study within the south-western zone of the country, as follows: (i) the reconstruction of Erekesan Market in Akure, (ii) the redevelopment of Oluwole Urban Market in Lagos, and (iii) the Ikeja Cantonment Ultra Modern Market Complex in Lagos. The replication approach to the multiple-case study is as illustrated in Figure 6.5. This diagram shows that each individual case study consists of a whole study, in which convergent evidence is sought regarding risk events that occur in these projects, their impacts on the project delivery as well as on stakeholders' satisfaction, and how they were managed.

Conclusions are then drawn from each case. These conclusions form the basis of the report presented in Chapter 8 of this study.

6. 6. 3. Criticisms of the Case Study

There are many traditional prejudices against the case study method (Yin, 2009). For instance, Miles (1979) advanced the following as shortcomings of case studies as a research strategy: (i) that case studies generate much stress for the researcher due to the added degree of energy required in conducting a case study, (ii) the process of preparing case studies takes too long and results in massive unreadable documents or reports, (iii) analysis and presentation of case study data requires more skill, hence more highly qualified (and scarce) researchers, (iv) case studies are subject to more risk of researcher bias than other research strategies, and (v) unlike quantitative research, there are few conventions the researcher can rely upon to defend him/her against self-delusion or the presentation of unreliable or invalid conclusions.

Yin (1981) agrees that there are shortcomings in the use of case studies as a research methodology, but contends that these shortcomings are not innate, and represent opportunities for development within the research strategy, arguing that refinement and standardisation of techniques can correct the practical shortcomings.

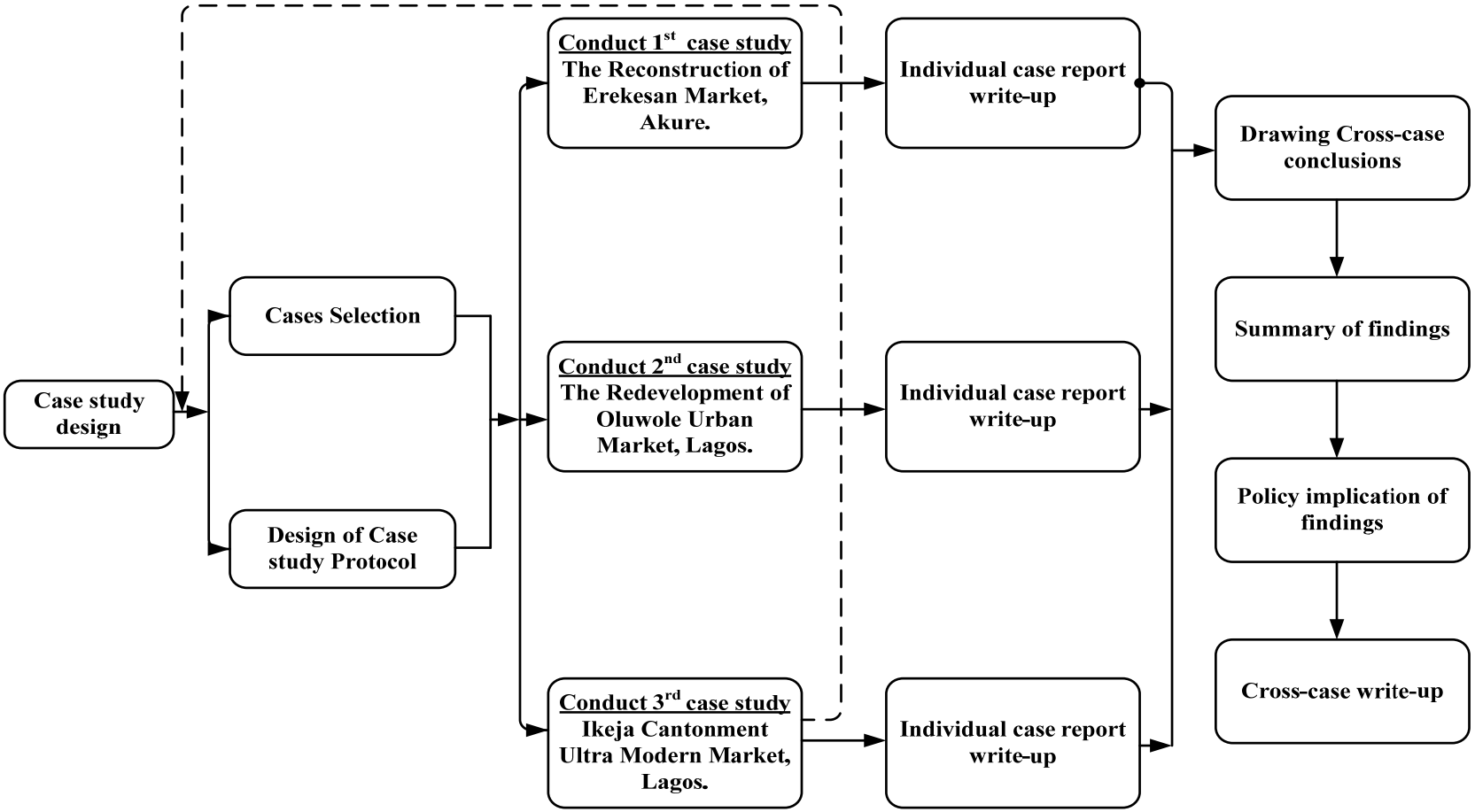

Figure 6.5: The replication approach to multiple-case study
Source: Adapted from Yin (2009) Case Study Research Design and Methods

Figure 6.5: The replication approach to multiple-case study

6. 6. 4. Precautionary Measures to Overcome Perceived Shortcomings of Case Studies

Perceived shortcomings against the use of case studies as a research strategy were identified in the previous section. However, researchers such as Eisenhardt (1991), Yin (1994), Brown and Eisenhardt (1997), Barkley (2006), Flyvbjerg (2006), Siggelkow, (2007) and Yin (2009), while writing in defence of the case study research strategy, argued that the strategy is a useful methodology of enquiry that is capable of yielding similar results to those of experimental research. They affirm that introducing more rigors when conducting case study research, refinement and standardisation of the technique, increasing the number of cases for study or multiple cases and working hard to report all evidence fairly will help correct some of these shortcomings.

Schell (1992) affirmed that the inherent flexibility built into the case study requires the researcher to be especially vigilant of methodological pitfalls to which case studies are prone. He then listed five factors that researchers need to take into account when designing a case study, as follows: (i) recognition of a phenomenon suitable for a case study, (ii) choice of a suitable form and sources for a case study, (iii) acquisition of the required training and ability to handle the flexibility of the method, (iv) possibility of practical problems such as access to information, value imputation by different actors, manipulation by actors and bias introduced due to inter/intra-organisational political processes, and (v) difficulties in generalising case information to other situations.

In order to establish the quality and to prove the value of case study research, therefore, Yin (2009) asserted that the four tests (i.e. construct validity, internal validity, external validity and reliability) discussed in the previous sections are relevant to case studies too (see Kidder and Judd, 1986, for more description of these tests). Yin (2009) presented four tactics for the design tests in case study research, as shown in Table 6.7.

Table 6.7: Case Study Tactics for Four Design Tests

Tests	Case Study Tactic	Phase of research in which tactic occurs
Construct validity	▪ Use multiple sources of evidence	Data collection
	▪ Establish chain of evidence	Data collection
	▪ Have key informants review draft case study report	Composition
Internal validity	▪ Do pattern-matching	Data analysis
	▪ Do explanation-building	Data analysis
	▪ Address rival explanations	Data analysis
	▪ Use logic models	Data analysis
External validity	▪ Use theory in single-case studies	Research design
	▪ Use replication logic in multiple-case studies	Research design
Reliability	▪ Use case study protocol	Data collection
	▪ Develop case study database	Data collection

Source: Yin (2009): Case Study Research Design and Methods.

6.6.4.1 Construct Validity

In line with Yin's (2009) suggestions in Table 6.7 on the issue of four design tests, in order to ensure that sufficient operational sets of measures are developed and that judgements are not based only on subjective evidence, or in other words to ensure the construct validity of the case study, multiple sources of evidence were employed during the data collection. Yin (ibid) discussed six sources of evidence, as follows: (i) documentations, (ii) archival records, (iii) interviews, (iv) direct observations, (v) participant observation, and (vi) physical artefacts. Of course, to these sources of evidence, questionnaires can be added, increasing the number to seven. For example, it is possible that there are too many people involved in a particular case to interview them all individually; this calls for a survey of a selected sample in this study. Since the study sought to also understand the satisfaction of the end users/stakeholders to the market

facilities, it is practically impossible to interview all the shoppers in the markets, even if it possible to interview all the traders.

Therefore out of these seven sources of evidence, interviews, documentary evidence, archival records and direct observation by the researcher were employed. Questionnaires were equally administered to the shoppers and traders on the cases being studied as discussed earlier, under the quantitative strand of the mixed method approach employed. Furthermore, according to Yin (2009), aside from the principle of using multiple sources of evidence, the benefits of the sources of evidence can be maximised if a researcher (i) creates a case study database, and (ii) maintains a chain of evidence. Since multiple sources of evidence were employed, convergent lines of inquiry were developed, which is a process of triangulation. Patton (2002) discussed four types of triangulation in doing evaluations: the triangulation (i) of data sources (data triangulation), (ii) among different evaluators (investigator triangulation), (iii) of perspectives on the same data set (theory triangulation), and (iv) of methods (methodological triangulation). The use of multiple sources of evidence, as employed here, is an example of data triangulation which, according to Yin (2009), addresses the potential problems of construct validity.

6.6.4.2 Internal and External Validity

The use of replication logic discussed previously and the choice of multiple-case studies actually addressed the problem of external validity, which concerns whether a study's findings are generalisable beyond the immediate case study. Having carefully selected the cases for study, and the development of replication logic as advised by Yin (2009), it can be assumed that the issue of external validity has been adequately addressed. Moreover, knowledge of the various analytical techniques most commonly used in case studies helps in selecting the cross-case synthesis techniques of analysis. According to Yin (2009), while other techniques such as pattern matching, explanation building, time-series analysis and logic models can be used for either single- or multiple-case studies, the cross-case synthesis technique applies specifically to the analysis of multiple case studies. In his words, this analysis is likely to be easier and the findings more robust than having only a single case. Therefore, due to the robustness of this analysis, it is assumed that internal validity of the case study has been adequately addressed.

Furthermore, as a precautionary step, when doing cross-case synthesis analysis, efforts were made to cover all the relevant evidence, and rival hypotheses and explanations were also tackled. In addition, there was more focus on the most significant aspect of the case study, i.e. the issue of risks in PPP markets and their management. Other issues emanating from a series of discussions with respondents which were not so relevant were discarded. The researcher's involvement and personal knowledge of the scheme also helped in carrying out this synthetic analysis. Having done this, the remaining issue is that of the reliability of the case study.

6.6.4.3 Reliability Test

When conducting multiple-case studies, Yin (2009) suggested that the researcher must exercise a great deal of patience and energy as well as excellent questioning and listening skills. He further argued that the following skills are commonly required of a case study investigator: the skill to (i) ask good questions and interpret the answers, (ii) be a good listener and not be trapped by her or his own ideologies or preconceptions, (iii) be adaptive and flexible, so that newly encountered situations can be seen as opportunities and not threats, (iv) have a firm grasp of the issues being studied, and (v) be unbiased by preconceived notions. According to him, all these skills will firmly affect the reliability of the case study. In view of this, Yin (ibid) continued by suggesting the use of Case Study Protocol (CSP), especially when a study involves multiple-case studies, so as to increase the reliability of the case study research.

Generally, a CSP should have four major sections, namely (i) an overview of the case study project, (ii) a field procedure (presentation of credentials, access to the case study sites, language pertaining to the protection of human subjects, and sources of data and procedural reminders), (iii) case study questions (the specific questions that the case study investigators must keep in mind in collecting data), and (iv) a guide for the case study report (Yin, 2009). In examining the structure or content of a CSP, it can be seen to be useful to the investigator in carrying out data collection. A CSP keeps the investigator targeted on the topic of the case study and helps the investigator to anticipate several problems, including the way the case study reports are completed.

With this in mind, a CSP was developed for this study, as shown in Appendix D. Its design follows the major points mentioned above, i.e. the protocol opens with a brief overview of the case study project, the aim and the objectives of the research, the need for the study and ethical issues. Moreover, the procedures to follow when collecting

data were highlighted and specific questions related to the research questions were also presented in the protocol. This was found to be very useful in the interviews with the respondents, as it assisted the researcher in keeping focused on the research objectives. In addition, since the CSP contained study questions which the case study investigator required answers to, the CSP was sent to the respondents ahead of time so as to give them an idea of the likely questions and the general focus of the interview. All these and many other precautions ensured the reliability of the study.

It was important to determine how many and which participants it was necessary to interview in order to provide the required data for the study, along with how to sample them. Due to the novelty of PPP in the country, especially in market developments, selected individuals were chosen as interview subjects. In other words, purposeful sampling was employed in the choice of the respondents. Interviews were conducted with respondents who have experience in the area of PPP market projects. In this study, these respondents were those who were actually involved in those cases mentioned previously. Among many purposeful sampling strategies discussed by Creswell (2008b), maximal variation sampling was employed, which involves the selection of diverse individuals. In this case, the selection was based on their role in the projects, for instance the public partners, private partners, consultants, lenders or sponsors etc. The reason for this was that risks mean different things to different people; therefore, to the public sector, what constitutes risk in the PPP market may be different to what constitutes risk to the private sector partners in the same projects. This therefore implies that risk as a concept was viewed from diverse perspectives, thus providing good qualitative evidence that generates a complex picture of risk in PPP market projects.

6.7 Summary of Chapter

In this chapter, the epistemological paradigm under which the research was conducted (i.e. pragmatic epistemology) was established. The choice of mixed methods that combines both quantitative and qualitative research strands together in a single study was also justified, and the two research strands described in detail. Data collection techniques employed under each strand were discussed in the chapter; for instance, under the quantitative strand, the design and administration of questionnaires were discussed along with the performance of different statistical tests employed to ensure its reliability and validity.

Moreover, the analytical techniques employed in the analysis of data collected through the questionnaires were also described in this chapter. Under the qualitative research strand, a case study methodology was employed; the structure of the case studies and the conducting of semi-structured interviews were discussed. Attempts were made to explain every precaution taken to ensure the validity and reliability of data gathered through the interviews and personal observations. The analytical techniques employed as well as the way and manner in which the results were to be presented were also discussed.

CHAPTER 7

DATA PRESENTATION, ANALYSIS AND DISCUSSION (1)

"Every philosophical problem, when it is subjected to the necessary analysis and justification, is found either to be not really philosophical at all, or else to be, in the sense in which we are using the word, logical".

Bertrand Russell (1872–1970), British philosopher.

7.1 Introduction

This chapter presents the results and the data analysis obtained through quantitative and qualitative research elements. The presentation, analysis and discussion have been divided into two, in line with the adopted convergent/triangulation mixed method research design. Firstly, the data analysis and the results from the questionnaire which was administered generally to shoppers and traders; and the content analysis of archival have been presented. Secondly, the thematic analysis of qualitative data collected through semi-structured interviews and personal observations have also been presented. The two results were subsequently merged together, and any possible areas of agreement and difference were identified and discussed in the chapter. In addition, efforts were made in this chapter to discuss and relate the results obtained from the two research elements with previous studies; and a summary of these findings have been clearly itemised in line with the study objectives.

7.2 Analysis and Discussion of the quantitative elements of the study

This section presents the analysis and discussion of findings from the quantitative elements of the study. This involves the analysis of data which was collected using the three sets of questionnaires (i.e. the general questionnaire that was administered to the construction industry professionals and the traders and shoppers within the markets under study). This section has been structured into five main parts. The first part deals with the analysis of demographic information pertaining to the respondents such as: their academic and professional qualifications; construction experience; number and types of projects they have conducted; their role within these projects; their designation and their experience within PPP projects.

The second part covers the analysis of respondents' opinions regarding general issues of concern within projects procured using the PPP strategy such as: types of PPP models they have previously used; the perceived benefits of PPPs; their awareness of different risk identification and analysis techniques and the parties responsible for the identification and analysis of risks in PPP projects.

In the third part of this section, the analysis of the responses from the questionnaires with regards to the probability of occurrence of the 68 identified risk factors in PPP projects, especially market projects and their associated impact has been presented. This has been facilitated in line with objectives one and two of the study. Moreover, the analyses of end users' opinions in terms of impact of the risks on their level of satisfaction with the market facility have also been presented.

The fourth part has analysed the practical mitigating measures for these risk factors and has evaluated the effectiveness of each and every measure.

The fifth part has tabulated the critical/significant risk factors in PPP market projects alongside possible mitigation measures which are to be integrated into the risk management framework. These will be developed after merging the results from the qualitative elements with the findings from this section.

7.3 Demographic/Background information about respondents

This is the first part of the quantitative analysis associated with the study. Table 7.1 has provided a summary of the demographic/background information pertaining to respondents. It is evident from the Table that 37.6% of respondents have obtained Masters' Degrees; whilst 28.0% have a minimum of a Higher National Diploma in their various fields of study. Furthermore, 72.0% of respondents are corporate members of their respective professional bodies, with 26.9% and 1.10% being Graduate and Fellow members of their respective professional bodies. In terms of construction experience, it is evident from Table 7.1 that respondents have an average of about 15.04 years' experience in the construction industry; and have also participated on average in about 8 PPP projects within the last five years.

Furthermore, Table 7.1 has shown that respondents' PPP experience covering the areas of: school projects; health facilities; road construction; market/retail development; airport construction and housing. It is also evident from the table that 37.6% of respondents have been involved in housing development using PPP arrangement; whilst 34.4% have participated in market development using PPP strategy. 11.8% of respondents have been involved in road construction; whilst 6.5% and 3.2% of respondents have participated in health facilities and airport development using PPP arrangement, respectively. The average value of these PPP projects executed in the last five years by respondents has been placed at ₦453.13m which is estimated at around £1,794 million when utilising an exchange rate of £1 – ₦245.60.

From the aforementioned information, it can be inferred that respondents have a reasonable knowledge of PPP; and it can therefore be concluded that the data provided by respondents can be relied upon for the purposes of analysis.

Table 7.1: Summary of respondents' background information.

Category	Classification	Frequency	Percentage (%)
Academic qualifications.	HND	26	28.0
	B.Tech/BSc	32	34.4
	M.Tech	35	37.6
	Total	**93**	**100.0**
Professional qualifications.	Graduate member.	25	26.9
	Corporate member.	67	72.0
	Fellow member.	1	1.1
	Total	**93**	**100.0**
Construction experience (in years).	1-5 years.	30	32.3
	6-10 years.	5	5.4
	11-20 years.	21	22.6
	21-30 years.	37	39.8
	Mean 15.04		
Number of PPP projects respondents' have managed in the last 5 years.	1-5	65	69.9
	6-10	6	6.5
	11-20	5	5.4
	21-30	16	17.2
	>30	1	1.1
	Mean 8.17		
Types of managed PPP projects.	Schools.	6	6.5
	Housing.	35	37.6
	Health facilities.	6	6.5
	Roads.	11	11.8
	Airports.	3	3.2
	Markets.	32	34.4
	Total	**93**	**100.0**
Project Cost (in million ₦).	Less than 250	23	24.7
	251-500	25	26.9
	501-750	17	18.3
	751-1,000	8	8.6
	>1,000	20	21.5
	Mean ₦ 453.13		
Role in the project.	Public/Government.	7	7.5
	Sponsor.	11	11.8
	Contractor.	43	46.2
	Consultant.	32	34.4
	Total	**93**	**100.0**

7.4 Precursor investigations

This section pertains to the quantitative element of the study whereby data analysis of the general questionnaire administered to the professionals within the industry has been determined. Specifically, the results of the analysis relating to the following areas have been presented in this section: (i) The frequency of use of different PPP models in Nigeria; (ii) The perceived benefits of PPPs; (iii) Level of awareness of different risk identification and analysis techniques; and (iv) Opinions of respondents with regards to the party which should be responsible for the identification and analysis of risks in PPP projects.

7.4.1 Frequency of use of different PPP models within the south-western Zone of Nigeria.

In the general questionnaire, a question was posed, requesting respondents to indicate the frequency of use of different PPP models from the lists of PPP models sourced from the literature and discussions with practitioners and researchers within PPP projects. Respondents were asked to score their opinions on a five-point Likert scale as shown in the general questionnaire (see Appendix A). The intention of this question was to understand the types of PPP models which were commonly used in the country. Through this an understanding would help to determine the nature of the contractual agreement between parties; as this would definitely affect the manner in which risk was going to be allocated between the private and public partners.

Since the scale of measurement is an ordinal, a non-parametric technique of analysis was employed. This is in line with the assertion made by Takim and Adnan (2008); Easterby-Smith *et al..,* (2002) and Siegel and Castellan, (1988) that non- parametric techniques are ideal for data that is measured on nominal and ordinal scales. Mean Score analytical techniques have been employed which can help to understand the score or the frequency of use of each model by calculating their mean scores (MS). Table 7.2 has shown the mean scores and ranking of the frequency of use of the identified PPP models in Nigeria. It can be seen from the table that 5 out of 18 PPP models have a MS between 2.5 and 3.10 representing slightly frequent; whilst the remaining 13 models have a MS between 2.43 and 1.66 indicating that they are not frequently used. Thus it can be inferred from this scoring that although practitioners in the country appeared to be aware of the different models and had already employed them on one or two projects which they had previously managed; their use/application had been infrequent. Build

Operate Transfer (BOT); Build Own Operate Transfer (BOOT); Joint Venture (JV); Build Transfer Operate (BTO); Turnkey and Design Build Maintain (DBM) with MS ranging between 3.08 and 2.54 indicated a slightly frequent application of these models. Moreover, it is evident from Table 7.2 that none of the models could be said to have a score within the high frequency range employed in the country. Alliancing and Integrator models were rated low with MS of 1.77 and 1.66 respectively which indicated that they are not frequently used.

Table 7.2: Frequency of application of PPP models within projects.

PPP Models.	**Scoring of frequency of use.**		
	Mean Score (MS).	**Rank.**	**Standard Deviation.**
Build Operate Transfer.	3.08	1	1.44
Build Own Operate Transfer.	2.83	2	1.46
Joint Venture.	2.73	3	1.22
Turnkey.	2.71	4	1.36
Build Transfer Operate.	2.68	5	1.42
Design Build Maintain.	2.54	6	1.35
Develop Operate Transfer.	2.43	7	1.31
Build Own Operate.	2.28	8	1.28
Lease.	2.25	9	1.25
Build Lease Transfer.	2.20	10	1.14
Competitive Partnership.	2.10	11	1.30
Rehabilitate Operate Transfer.	2.02	12	1.14
Contract Add and Operate.	1.96	13	1.02
Rehabilitate Own Operate.	1.81	14	1.05
Rehabilitate Operate Lease.	1.80	15	1.08
Bundling.	1.80	15	1.05
Alliancing.	1.77	17	0.99
Integrator.	1.66	18	0.95

These findings can be said to be in agreement with the findings of Dada *et al.*., (2006) who reported that 18 out of the 21 PPP projects they surveyed in Lagos State used either JV or BOT models. Moreover the fact that respondents signified that they have applied these models on one project or the other corroborates the findings of Yusuf (2005) that other PPP models such as DBFO, BOOT and equity participation are other typical areas of private sector involvement in the country. From Table 7.2 it is evident that BOT, BOOT and JV models top the list of most frequently used PPP models in the country.

7.4.2 Perceived benefits of PPP in infrastructure development.

Table 7.3 has shown respondents' assessment of the perceived benefits of PPP in infrastructure development. From the results, it is evident that all the ten perceived benefits were rated as potential benefits; and that PPP application was deemed capable of delivering within infrastructure development. Respondents believed that the cooperation of the public and private sector in the development of infrastructure could result in overall construction performance; acquiring value for money; faster implementation of the project; an improved level of service and enhanced facility maintenance and overall economic development. These benefits were rated as the first five benefits of PPP in infrastructure development with MS of 4.11, 3.87, 3.78, 3.76 and 3.73, respectively.

Table 7.3: Assessment of perceived benefits of PPP in infrastructure development.

Perceived benefits of private sector participation in infrastructure development.	**Scoring**		
	Mean Score (MS).	**Rank.**	**Standard Deviation.**
Construction performance.	4.11	1	0.65
Value for money.	3.87	2	0.81
Faster implementation (Government is dealing with one single party).	3.78	3	0.81
Improved level of service and enhanced facility maintenance.	3.76	4	0.76
Development of new business sector/enhanced economic development.	3.73	5	0.82
Delivering on time.	3.72	6	0.70
Operational performance (proper functioning and fund management during operation).	3.70	7	0.91
Innovation and spread of best practice.	3.61	8	0.93
Risk sharing.	3.34	9	0.77
Delivering to budget.	3.28	10	0.85

Moreover, delivering to budget and risk sharing with MS of 3.28 and 3.34 respectively provided the lowest ratings. This however may be true as the majority of the projects reviewed i.e. the PPP market projects were found to have experienced cost and time overrun. Moreover, scoring or rating of 3.72 for delivering on time indicated that PPP was also capable of helping projects to be delivered on time. This is in agreement with the findings of other researchers on the benefits associated with PPPs, for example:

Lane and Gardiner, 2003; Grimsey and Lewis, 2004 and Akintoye, 2006. Such researchers have suggested that some of the reasons why governments at all levels, in both developing and developed countries, are turning towards the private sector in infrastructural development are: (i) To enhance the performance of construction projects; (ii) To obtain better value for money; and (iii) For the spread of best practice and innovative ideas, among many others.

7.4.3 Respondents' awareness of various risk identification and analysis techniques

The aim of the analysis presented in this sub-section was to assess the level of awareness by respondents with regards to the various risk identification and analysis techniques. Following an extensive literature review and discussions with practitioners in the industry, 10 different risk identification and analysis techniques were identified. These were subsequently included in the general questionnaire survey which was administered to practitioners who had been involved in PPP projects in order to obtain their opinions on their levels of awareness of these techniques.

Table 7.4 and Figure 7.1 have provided the awareness levels of practitioners within the study area associated with the different risk identification techniques. It is evident from both sources that respondents appeared to have knowledge of all the risk identification techniques identified from the literature, although at varying degrees. It is obvious that a larger percentage of respondents had good knowledge of the potential of Site Visit (SV); Consultation With Expert in the area (CWE), Brainstorming (BR), Personal and Corporate Experience (PCE), Research, interviews and surveys and organisational charts as risk identification tools and techniques; as each of these techniques had a percentage above 50%. Moreover, from Table 7.4 and Figure 7.1, it is evident that for risk identification techniques such as the Flow Chart (FC) and Analysis of Assumption (AA) less than 50% of respondents indicated that they were aware of them. We can infer therefore that the majority of respondents did not have knowledge of these risk identification techniques. It is surprising to note that a greater percentage of respondents did not have the knowledge of intuitive insight as a risk identification tool as 63.4% of respondents stated that they were not aware of it.

Table 7.4: Respondents' awareness level of risk identification techniques.

Risk identification techniques.	Level of awareness.			
		Percentage.	Valid Percentage.	Cumulative Percentage.
Personal and Corporate Experience (PCE).	Aware.	59.1	59.1	59.1
	Not Aware.	40.9	40.9	100.0
	Total.	100.0	100.0	
Safety Reviews (SR).	Aware.	46.2	46.2	46.2
	Not Aware.	53.8	53.8	100.0
	Total.	100.0	100.0	
Intuitive Insights (ITI).	Aware.	36.6	36.6	36.6
	Not Aware.	63.4	63.4	100.0
	Total.	100.0	100.0	
Brainstorming (BR).	Aware.	67.7	67.7	67.7
	Not Aware.	32.3	32.3	100.0
	Total.	100.0	100.0	
Site Visits (SV).	Aware.	74.2	74.2	74.2
	Not Aware.	25.8	25.8	100.0
	Total.	100.0	100.0	
Organisational Charts (OC).	Aware.	57.0	57.0	57.0
	Not Aware.	43.0	43.0	100.0
	Total.	100.0	100.0	
Flow Charts (FC).	Aware.	43.0	43.0	43.0
	Not Aware.	57.0	57.0	100.0
	Total.	100.0	100.0	
Research, Interviews and Surveys (RIS).	Aware.	57.0	57.0	57.0
	Not Aware.	43.0	43.0	100.0
	Total.	100.0	100.0	
Consultation With Experts (CWE).	Aware.	74.2	74.2	74.2
	Not Aware.	25.8	25.8	100.0
	Total.	100.0	100.0	
Analysis of Assumptions (AA).	Aware.	49.5	49.5	49.5
	Not Aware.	50.5	50.5	100.0
	Total.	100.0	100.0	

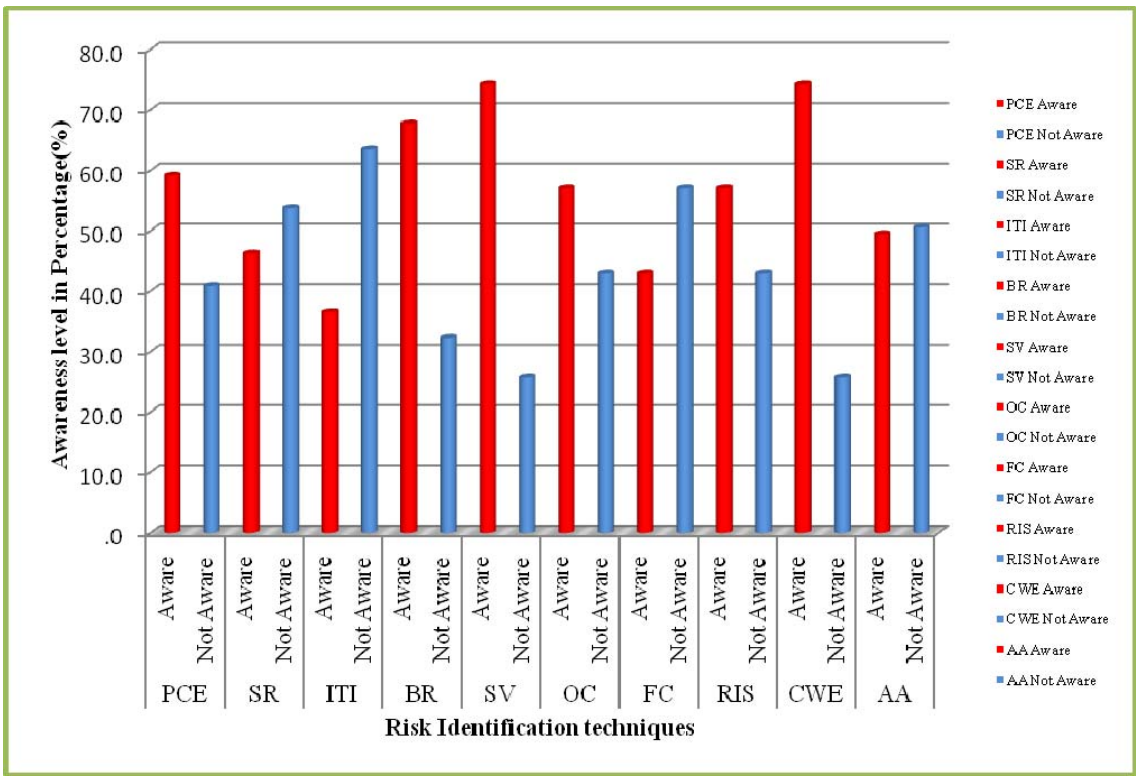

Figure 7.1: Respondents' level of awareness of risk identification techniques.

Overall, it is evident that respondents had very good knowledge of SV and CWE with 74.2% of the respondents indicating awareness. These were followed by BR and PCE with 67.7% and 59.1% respectively. With regards to the risk identification tool that respondents were not aware of ITI was followed closely by FC with 63.4% and 57% of respondents, respectively.

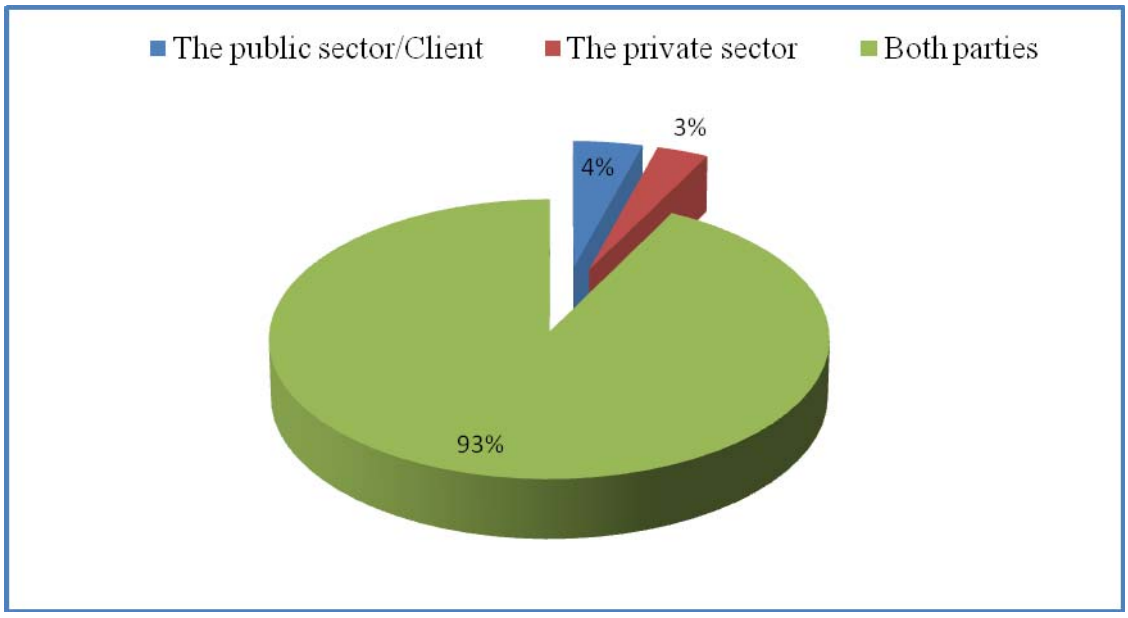

Figure 7.2: Respondents' opinions on parties which should be responsible for project risk identification within the PPP project.

With regards to project risk identification, respondents were asked to identify who should be responsible, between private and public partners, for the task of project risk identification within a PPP project. Figure 7.2 has shown that 93% of respondents indicated that both parties i.e. the public and private sector should be responsible for identification of project risk in any PPP project; whilst 4% and 3% were of the opinion that the public sector and private sector should be responsible respectively. Thus it can be concluded that a larger percentage of respondents believed that the task of risk identification should be the responsibility of all and not purely one particular party within the contract. This can be said to be true since what the private partner will count as risk may not be seen as a risk by the public partner. It is imperative therefore that each party to the contract can identify the likely risks which they may be exposed to in the course of executing the project.

Similarly, respondents were asked to signify their utilisation level of different risk analysis techniques available in the construction industry. Table 7.5 and Figure 7.3 has shown that out of the 10 risk analysis techniques listed in the questionnaire, 57% of respondents have indicated that they have used Internal Rate of Return (IRR) on one project or the other; whilst 50.5% have indicated employment of Critical Path Analysis techniques (CPA).

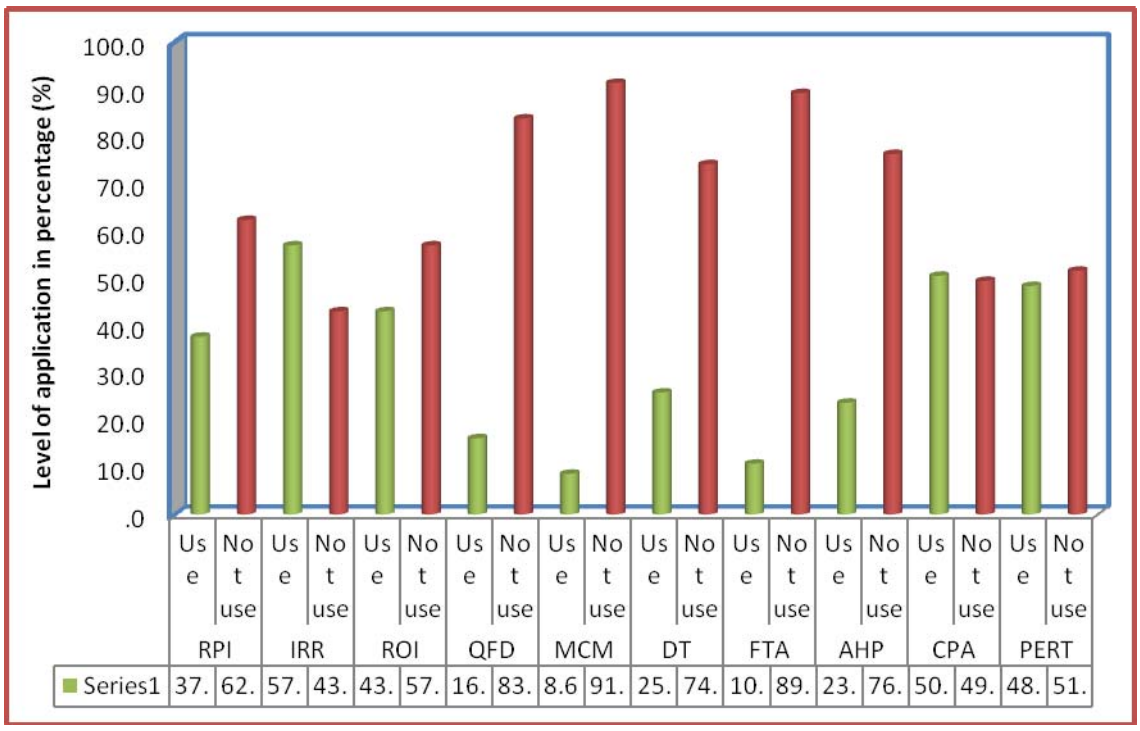

Figure 7.3: Respondents' utilisation level of risk analysis techniques.

Table 7.5: Utilisation level of risk analysis techniques by respondents.

Risk analysis. techniques.	**Level of application.**			
		Percentage.	**Valid Percentage.**	**Cumulative percentage.**
Risk Probability and Impact (RPI).	Used.	37.6	37.6	37.6
	Not Used.	62.4	62.4	100.0
	Total.	100.0	100.0	
Internal Rate of Return (IRR).	Used.	57.0	57.0	57.0
	Not Used.	43.0	43.0	100.0
	Total.	100.0	100.0	
Return on Investment (ROI).	Used.	43.0	43.0	43.0
	Not Used.	57.0	57.0	100.0
	Total.	100.0	100.0	
Quality Function Development (QFD).	Used.	16.1	16.1	16.1
	Not Used.	83.9	83.9	100.0
	Total.	100.0	100.0	
Multi Criteria and Table Methods (MCM).	Used.	8.6	8.6	8.6
	Not Used.	91.4	91.4	100.0
	Total.	100.0	100.0	
Decision Tree (DT).	Used.	25.8	25.8	25.8
	Not Used.	74.2	74.2	100.0
	Total.	100.0	100.0	
Fault Tree Analysis (FTA).	Used.	10.8	10.8	10.8
	Not Used.	89.2	89.2	100.0
	Total.	100.0	100.0	
Analytic Hierarchy Process (AHP).	Used	23.7	23.7	23.7
	Not Used.	76.3	76.3	100.0
	Total	100.0	100.0	
Critical Path Analysis (CPA).	Used.	50.5	50.5	50.5
	Not Used.	49.5	49.5	100.0
	Total.	100.0	100.0	
Program Evaluation and Review Technique (PERT).	Used.	48.4	48.4	48.4
	Not Used.	51.6	51.6	100.0
	Total.	100.0	100.0	

From Table 7.5 and Figure 7.3 it is evident that larger percentages of respondents have not used techniques such as: Multi Criteria and Table Methods (MCM); the Quality Function Development (QFD) technique; the Analytic Hierarchy Process (AHP) technique; Fault Tree Analysis (FTA); Decision Tree (DT) and Risk Probability and Impact (RPI). The most commonly used analysis techniques can subsequently be stated to be IRR and CPA.

7.5 Assessment of the likelihood/probability of occurrence of identified risk events

The main aim of the study has been to develop a holistic framework for Risk Management in privately financed market projects. In order to achieve this aim, one of the objectives has been to identify and generally evaluate the critical risks inherent within PPP projects; with an emphasis on PPP market projects in the south-western part of Nigeria. As previously discussed, 68 risk factors related to PPPs were compiled from various literature such as: Ibrahim and Price (2006); Ayeni (2005); Li *et al.*., (2005); Xenidis and Angelides (2005); Yusuf (2005); Aboki (2005) and Akintoye *et al.*., (1998) to mention a few. It was evident that such studies indicated the possibility of difference in the opinions of the key stakeholder groups. Therefore, in the development of the questionnaire and for ease of administration, exogenous and endogenous classification by Ibrahim, Price and Dainty (2006) was adopted. For those risks which were either external or internal to PPP projects, respondents were asked to rate their probability or likelihood of occurrence using a 5-point Likert scale; whereby 5 represented very likely and 1 not likely (see Appendix A for the questionnaire). The intent was to use the results from this analysis and from the assessment of their impact to compute the Criticality Index (CI) for each risk event.

For simplified data analysis and presentation, different coding was employed for the probability of occurrence, impact and allocation preference of risk factors. Appendix E and F has shown the various coding which was employed for the exogenous and endogenous risks respectively. Data collected from the 93 practitioners were subjected to descriptive analysis of the PASW statistic 18 software after the data was split using the roles of respondents in terms of particular PPP projects. The data was split into four mutually exclusive or independent groups namely: Government, Sponsor, Contractors and Consultants.

Appendix H_i and H_{ii} have shown the ratings provided by those groups of respondents on the probability of occurrence of exogenous and endogenous risk factors respectively. The overall rating as provided by respondents was also computed and presented alongside the ratings from each group. Appendix H_i and H_{ii} also provided the results of the Kruskal-Wallis One-Way ANOVA test for a K independent sample. This test was conducted to determine whether there was a significant difference of opinion between the groups at a significance level of 5%. Under this test, the Chi-Square value, the degrees of freedom (df) 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 (e.g. 0.04, 0.010.001), there is a statistically significant difference in opinions across the four groups.

Table: 7.6: Overall rating of the likelihood/probability of occurrence of exogenous /external risk factors.

Risk factor coding.	**Description of risk factor.**	**Overall Rating.**		**Chi-Square Value.**	**Kruskal Wallis Sig p.**
		MS	**Ranking**		
V20AEX1	Unstable government.	3.98	1	10.326	0.016**
V20AEX13	Corruption and lack of respect for law.	3.84	2	10.212	0.017**
V20AEX4	Strong political opposition/hostility.	3.76	3	1.837	0.607
V20AEX19	Non-involvement of host-community.	3.72	4	4.296	0.231
V20AEX5	Inconsistencies in government policies.	3.65	5	5.033	0.169
V20AEX7	Inflation rate volatility.	3.56	6	2.395	0.494
V20AEX14	Import/Export restrictions.	3.47	7	5.376	0.146
V20AEX9	Exchange rate fluctuation.	3.43	8	2.306	0.511
V20AEX3	Poor public decision making process.	3.40	9	7.641	0.054
V20AEX11	Legislation change/inconsistencies.	3.35	10	1.567	0.667
V20AEX8	Interest rate volatility.	3.34	11	5.148	0.161
V20AEX2	Possible expropriation/ nationalisation of assets.	3.29	13	1.439	0.696
V20AEX10	Influential economic event (boom/recession).	3.26	13	11.711	0.008**
V20AEX18	Public opposition to projects.	3.23	14	4.397	0.222
V20AEX6	Poor financial market.	3.20	15	10.057	0.018**
V20AEX20	Cultural differences between main stakeholders.	3.06	16	9.414	0.024
V20AEX24	Geotechnical conditions.	3.06	16	3.302	0.347
V20AEX21	Force majeure.	3.04	18	14.364	0.002**
V20AEX22	Weather.	3.00	19	6.631	0.085

V20AEX17	Lack of tradition of private provision of public services.	2.95	20	1.290	0.732
V20AEX23	Environment of the project.	2.89	21	3.581	0.310
V20AEX12	Change in tax regulation.	2.88	22	6.579	0.087
V20AEX16	Industrial regulation change.	2.72	23	7.920	0.048
V20AEX15	Rate of returns restrictions.	2.56	24	4.909	0.179

**There is a statistically significant difference of opinion between the groups.

Table 7.6 has shown the overall mean score of the rating given to each exogenous risk factor by the four groups (i.e. Government, Sponsor, Contractors and Consultants). It is evident from Table 7.6 that, going by the overall Mean Score (MS), the top 10 exogenous risk factors with high probability of occurrence are: unstable government; corruption and lack of respect for law; strong political opposition, non-involvement of host community; inconsistencies in government policies; inflation rate volatility; import/export restrictions; exchange rate fluctuation; poor public decision making process and legislation change/inconsistencies. Although, among these top ten risk factors, there were significant differences of opinion between the groups under unstable government and corruption and lack of respect for law as their Sig. p value of 0.016 and 0.017 respectively was less than 0.05. However, a cursory look at their MS provided an indication that these two risk factors were likely to occur as their individual MS from all the groups ranged between 2.86 and 4.45 which represented somehow likely and likely.

From Appendix H_i, whilst from the government side, unstable government was ranked in the 16th position out of the 24 exogenous risk factors with MS of 2.86; it was ranked 1st by contractors and consultants with MS of 3.98 and 4.06 respectively. It is interesting to note that unstable government was ranked 2nd by sponsors with MS of 4.45. Similarly, corruption and lack of respect for law was rated 1st by the sponsor; whilst from the government group it was rated in 8th position with MS of 3.29.

Contractors and consultants provided this risk factor a 2nd and 5th rating with MS of 3.93 and 3.84 respectively. These ratings have concurred with the assertion of Ojo (2001) that an unstable government and unstable economic climate within Nigeria have been a serious bane to the performance of the construction industry in Nigeria.

Moreover, from Table 7.6, out of the 24 external risks to PPP projects, Lack of tradition of private provision of public services; environment of the project; change in tax regulation; industrial regulation change and rate of returns restrictions were the least ranked risk factors with overall MS of 2.95, 2.89, 2.88, 2.72, and 2.56. The Kruskal-Wallis test revealed that there was no difference in the opinion between the groups to these five risk factors as their Sig. p value was greater than 0.05. Furthermore, the probability of occurrence of endogenous risk factors was equally assessed. Appendix H_{ii} shows the MS across the groups, the overall MS, Chi-Square values and the Kruskal-Wallis test results.

Table 7.7. Overall rating of the likelihood/probability of occurrence of endogenous risk factors

Risk factor coding.	**Description of risk factor.**	**Overall Rating.**		**Chi-Square Value.**	**Kruskal Wallis Sig p.**
		MS	**Ranking**		
V20AEN39	Lack of commitment from public/ private partner.	4.05	1	1.991	0.574
V20AEN21	Construction time overrun.	3.91	2	5.844	0.119
V20AEN20	Construction cost overrun.	3.90	3	4.262	0.235
V20AEN36	Inadequate experience in PPP.	3.83	4	3.959	0.266
V20AEN6	Availability of finance.	3.81	5	11.483	0.009**
V20AEN7	High finance cost.	3.73	6	12.684	0.005**
V20AEN26	Excessive contract variation.	3.72	7	15.253	0.002**
V20AEN31	Low operating productivity.	3.71	8	16.589	0.001**
V20AEN25	Poor quality of workmanship.	3.65	9	2.027	0.567
V20AEN33	Higher than expected maintenance cost.	3.58	10	18.477	0.000**
V20AEN30	Operation cost overrun.	3.56	11	4.499	0.212
V20AEN13	Lack of government guarantees.	3.52	12	7.952	0.047**
V20AEN1	Land acquisition/site availability.	3.51	13	9.382	0.025**
V20AEN17	Delay in project approvals and permits.	3.51	13	4.395	0.222
V20AEN14	Bankruptcy of concessionaire.	3.49	15	21.779	0.000**
V20AEN8	Lack of creditworthiness.	3.46	16	8.554	0.036**
V20AEN12	Inability to service debt.	3.43	17	14.736	0.002**
V20AEN11	High bidding costs.	3.41	18	7.106	0.069
V20AEN27	Insolvency/default of subcontractors and suppliers.	3.37	19	3.353	0.340
V20AEN35	Life of facility shorter than that anticipated.	3.37	19	2.566	0.464
V20AEN15	Financial attraction of project to investors.	3.35	21	7.011	0.072

V20AEN24	Late design changes.	3.33	22	8.509	0.037**
V20AEN38	Inadequate distribution of responsibilities and risks.	3.31	23	2.199	0.532
V20AEN9	Liquidity.	3.30	24	12.287	0.006**
V20AEN32	Maintenance more frequent than expected.	3.30	24	16.954	0.001**
V20AEN4	Competition risk.	3.28	26	2.098	0.552
V20AEN2	Level of demand for the project.	3.24	27	7.476	0.058
V20AEN3	Prolonged negotiation period prior to initiation.	3.19	28	6.198	0.102
V20AEN40	Inadequate distribution of authority between partners.	3.18	29	7.043	0.071
V20AEN18	Design deficiency.	3.17	30	11.174	0.011**
V20AEN10	Depository.	3.14	31	14.091	0.003**
V20AEN37	Organisation and coordination risk.	3.14	31	1.383	0.710
V20AEN19	Unproven engineering techniques.	3.13	33	10.241	0.017**
V20AEN5	Fault in tender specification.	3.09	34	2.371	0.499
V20AEN41	Different working methods/know-how between partners.	3.09	34	2.103	0.551
V20AEN29	Operational revenue below projection.	3.08	36	3.170	0.366
V20AEN34	Competitive market (a product with a close substitute).	3.04	37	8.735	0.033**
V20AEN22	Availability of appropriate labour/material.	3.03	38	1.876	0.598
V20AEN28	Risk regarding pricing of product/service.	3.02	39	7.180	0.066
V20AEN42	Counter party's creditworthiness.	3.02	39	3.654	0.301
V20AEN23	Manpower problem associated with trade unions.	3.00	41	2.460	0.482
V20AEN43	Staff crises.	2.94	42	0.559	0.906
V20AEN16	Residual value (after concession period).	2.90	43	7.890	0.048
V20AEN44	Third party tort liability.	2.87	44	2.276	0.517

**There is a statistically significant difference of opinion between the groups.

The results from Table 7.7 have shown that all the 44 risk events that are internal to a PPP project were rated to have some element of likelihood of occurrence. Looking at Table 7.7, it is evident that none of the risk events have MS less than 2.00 as a rating of 1.00 has represented not likely. The reliability of this 5-point Likert scale employed to measure this probability of occurrence has been validated through Cronbach's α value of 0.914 for this measure as presented in Table 6.6. Lack of commitment from public/private partner; construction time overrun; construction cost overrun; inadequate experience in PPP; availability of finance; high finance cost; excessive contract variation; low operating productivity; poor quality of workmanship and maintenance

cost higher than expected were among the top ten (10) internal risk events that were likely to occur on any PPP projects. This is evident from the fact that these risk events have overall MS ranging between 4.95 and 3.58. It can be deduced from this result that the problem of inadequate PPP experience is a general problem within developing countries. This result has concurred with the assertion made by Ogunlana (1997) who stated that some of the problems associated with PPP projects within the Asian continent, particularly Thailand, were the result of inadequate experience of PPP. Similarly, the problem of excessive contract variation, construction time and cost overrun; as well as availability of finance would appear to be recurring in studies pertaining to the performance of the construction industry in Nigeria as in Ogunsemi (2002) which found excessive variation to be one of the factors responsible for the poor performance of construction projects in terms of time and cost.

Moreover, with regards to high finance cost, given the current interest rate of between 19-25% on any solicited loan from a finance institution in Nigeria, one would expect that this would be ranked as having a higher probability of occurrence. However, it was surprising to note that the government representative provided a score of 2.14 and a ranking position of 44th to this factor; whereas sponsors and consultants ranked it 1st and 4th respectively. Nevertheless, the fact that availability of finance and high finance cost were ranked in 5th and 6th position respectively, concurred with the findings of a report by the World Economic Forum (WEF, 2010) on Global Competitiveness of 139 countries. It was reported that availability of finance services and affordability of finance service were the most problematic for facilitating business in Nigeria with a ranking position of 90th and 84th respectively among 139 countries under review for the year 2010 - 2011. This was also corroborated by Ogunlana (2010) when he asserted that the cost of a mobile phone in Thailand was far less when compared to what an average Nigerian would pay for the service. Ogunlana attributed this to the high tariff and to the high cost of the infrastructure needed to support the service in Nigeria.

It was also revealed in Table 7.7 that the manpower problem associated with trade unions; staff crises; residual value (after concession period) and third party tort liability were the four (4) least ranked internal risk events in term of their likelihood of occurrence. The Asymp. Sig. p value for each risk factor, as shown in Table 7.7 has revealed that there were statistically significant differences between opinions of respondents on the rating of the likelihood of occurrence of 16 risk events. These risk

events are those with a Sig. p value of less than 0.05 as indicated by an asterisk (*) after their p-value. Looking at the rating of those risk factors where there was no agreement by respondents as presented in Appendix H_{ii}; it is evident that consultants ranked availability of finance 1st; whilst government and sponsor ranked it 14th and 28th respectively. Respondents from the government side were of the opinion that before a concessionaire was granted, the source of the fund/finance could have been identified and thus the likelihood of non-availability of finance may not have arisen at all.

7.6 Assessment of the impact of potential identified risk events

The magnitude of the potential impact of each of the 68 identified risk factors on any PPP project was also assessed. Practitioners were asked to indicate their assessment of the impact of identified risk using a 5-point scale Likert scale whereby: 1 Implied negligible impact; 2 Marginal impact; 3 Substantial; 4 Severe; and 5 Disastrous. This section therefore presents the rating given to each risk factor based on their assessment of the impact the risk would have on the project if it were to occur.

In Appendix J_1 and J_2, as in H_i and Hii, the ratings of the impact of both exogenous and endogenous risk factors identified by different groups of respondents has been presented. The overall ratings across the groups were also computed and the Kruskal Wallis Sig. p test was conducted equally to show the agreement in the opinion of respondents in their ratings. Table 7.8 has shown the overall ratings of the exogenous/external risks, the Chi-Square value and Kruskal-Wallis Sig.p. From the table, all the 24 exogenous risk factors compiled from the literature were rated as having a significant impact on PPP projects as they all had an overall MS ranging between 2.67 and 3.91. From the scale employed a score of 3 represented a substantial impact; whilst 4 represented a severe impact.

Table 7.8: The overall rating of the impact of exogenous risk factors.

Risk factor coding.	Description of risk factors.	Overall rating.		Chi-Square Value.	Kruskal Wallis Sig p.
		MS	Ranking		
V20BEX1	Unstable government.	3.91	1	12.638	0.005**
V20BEX13	Corruption and lack of respect for law.	3.73	2	6.642	0.084
V20BEX4	Strong political opposition/hostility.	3.71	3	10.398	0.015**
V20BEX5	Inconsistencies in government policies.	3.71	3	2.344	0.504
V20BEX7	Inflation rate volatility.	3.60	5	2.657	0.448
V20BEX6	Poor financial market.	3.57	6	3.919	0.270
V20BEX11	Legislation change/inconsistencies.	3.47	7	5.641	0.130
V20BEX14	Import/Export restrictions.	3.39	8	1.623	0.654
V20BEX8	Interest rate volatility.	3.30	9	6.206	0.102
V20BEX10	Influential economic event (boom/recession).	3.28	10	10.038	0.018**
V20BEX9	Exchange rate fluctuation.	3.24	11	14.863	0.002**
V20BEX3	Poor public decision making process.	3.22	12	7.547	0.056
V20BEX19	Non-involvement of host-community.	3.18	13	3.914	0.271
V20BEX18	Public opposition to projects.	3.09	14	2.468	0.481
V20BEX12	Change in tax regulation.	3.06	15	11.576	0.009**
V20BEX2	Possible expropriation/ nationalisation of assets.	2.98	19	2.762	0.430
V20BEX17	Lack of tradition of private provision of public services.	2.94	17	5.034	0.169
V20BEX15	Rate of return restrictions.	2.91	18	1.372	0.712
V20BEX24	Geotechnical conditions.	2.89	19	7.070	0.070
V20BEX21	Force majeure.	2.81	20	2.901	0.407
V20BEX22	Weather.	2.81	20	13.641	0.003**
V20BEX16	Industrial regulation change.	2.74	22	2.010	0.570
V20BEX20	Cultural differences between main stakeholders.	2.71	23	3.919	0.270
V20BEX23	Environment.	2.67	24	10.470	0.015**

**There is a statistically significant difference of opinion between the groups.

Table 7.9: The overall rating of the impact of endogenous risk factors.

Risk factor coding.	Description of risk factor.	Overall rating.		Chi-Square Value.	Kruskal Wallis Sig p.
		MS	Ranking		
V20BEN6	Availability of finance.	3.78	1	2.935	0.402
V20BEN7	High finance cost.	3.77	2	7.424	0.060
V20BEN20	Construction cost overrun.	3.68	3	4.637	0.200
V20BEN26	Excessive contract variation.	3.68	3	13.743	0.003**
V20BEN25	Poor quality of workmanship.	3.65	5	2.378	0.498
V20BEN36	Inadequate experience in PPP.	3.62	6	9.879	0.020**
V20BEN8	Lack of creditworthiness.	3.59	7	4.630	0.201
V20BEN14	Bankruptcy of concessionaire.	3.57	8	5.048	0.168**
V20BEN35	Life of facility shorter than that anticipated.	3.56	9	6.851	0.077
V20BEN39	Lack of commitment from public/ private partner.	3.53	10	8.296	0.040**
V20BEN18	Design deficiency.	3.51	11	0.648	0.885
V20BEN21	Construction time overrun.	3.49	12	13.160	0.004**
V20BEN9	Liquidity.	3.47	13	1.536	0.674
V20BEN29	Operational revenue below projection.	3.46	14	0.879	0.830
V20BEN24	Late design changes.	3.39	15	4.946	0.176
V20BEN27	Insolvency/default of subcontractors and suppliers.	3.39	15	7.589	0.055
V20BEN38	Inadequate distribution of authority between partners.	3.38	17	1.278	0.734
V20BEN19	Unproven engineering techniques.	3.35	18	12.326	0.006**
V20BEN12	Inability to service debt.	3.34	19	2.352	0.503
V20BEN17	Delay in project approvals and permits.	3.34	19	1.157	0.763
V20BEN32	Maintenance more frequent than expected.	3.34	19	9.048	0.029**
V20BEN13	Lack of government guarantees.	3.33	22	1.373	0.712
V20BEN37	Organisation and coordination risk.	3.30	23	6.750	0.080
V20BEN15	Financial attraction of project to investors.	3.24	24	1.954	0.582
V20BEN31	Low operating productivity.	3.24	24	1.249	0.741
V20BEN10	Depository.	3.22	26	2.414	0.491
V20BEN28	Risk regarding pricing of product/service.	3.22	26	16.148	0.001**
V20BEN1	Land acquisition/site availability.	3.20	28	2.274	0.517
V20BEN2	Level of demand for the project.	3.20	28	6.802	0.078
V20BEN33	Maintenance cost higher than expected.	3.20	28	2.841	0.417
V20BEN30	Operation cost overrun.	3.18	31	3.701	0.296
V20BEN4	Competition risk.	3.14	32	5.027	0.170
V20BEN5	Fault in tender specification.	3.12	33	6.141	0.105

V20BEN11	High bidding costs.	3.11	34	2.637	0.451
V20BEN34	Competitive market (a product with a close substitute).	3.08	35	5.230	0.156
V20BEN22	Availability of appropriate labour/material.	3.05	36	3.157	0.368
V20BEN41	Different working methods/know-how between partners.	3.02	37	9.394	0.024**
V20BEN42	Counter party's creditworthiness.	3.02	37	5.502	0.139
V20BEN3	Prolonged negotiation period prior to initiation.	2.99	39	12.404	0.006**
V20BEN43	Staff crises.	2.99	39	17.449	0.001**
V20BEN16	Residual value (after concession period).	2.94	41	4.000	0.261
V20BEN23	Manpower problem associated with trade unions.	2.90	42	3.065	0.382
V20BEN44	Third party tort liability.	2.89	43	11.323	0.010**
V20BEN40	Inadequate distribution of responsibilities and risks.	2.85	44	7.604	0.055

**There is a statistically significant difference of opinion between the groups.

Table 7.8 has also revealed that unstable government was rated 1st with a MS of 3.91. This could be related to the fact that in Nigeria the maximum term in office is usually 4 years; and as revealed in the literature, as soon as there has been a change in government, the successive government jettisons the policies of their predecessors leading to a lack of continuity in government policies. This arguably could have a detrimental effect on a PPP project which would usually run between 25-25 years. Ranked successively to unstable government in terms of impact was corruption and lack of respect for law in the country. It is not surprising to note that there was no statistically significant difference in the opinion across groups with regards to this factor. This finding could reinforce the findings of Transparency International (2010) which ranked Nigeria 134th out of 178 countries reviewed by the Corruption Perception Index (CPI) of 2.4 for the year 2010.

Moreover, strong political opposition/hostility; inconsistencies in government policies; poor financial market and legislation change/inconsistencies were some of the top 10 risk factors rated to have a substantial impact on the project if they were to occur. Amongst the 24 external risk factors, force majeure; weather; industrial regulation change; cultural differences between main stakeholders and project environment were the least ranked risk factors.

Similarly, in Table 7.9, all the 44 internal risk factors were rated to have a potentially substantial impact on any PPP projects if they were to occur. Nevertheless, the level of impact varied from one risk to another. From the Table, amongst the 44 risk factors, availability of finance; high finance cost; cost overrun and excessive variation topped the list with MS of 3.78, 3.77 and 3.68 respectively. A look at the Sig. p. values of these risk factors revealed that there were no significant differences in opinion across the groups. Although inadequate distribution of responsibilities and risks came last with a MS of 2.85; this still denoted a substantial impact on the project.

7.7 Assessment of the criticality of the identified risk events

Having assessed the likelihood of occurrence and the potential impact these risk factors would have on the project, the next thing was to calculate the Risk Criticality Index (RCI) for each factor. In calculating the RCI, the overall rating for likelihood of occurrence for each risk is multiplied by the overall score for the risk impact and the product is subsequently divided by 25. The closer the index is to 1, the more critical the risk factor actually is. (e.g. 0.90 is more critical that 0.4).

Table 7.10 has shown the criticality of both the exogenous and endogenous risk factors using their criticality index. The decisional rule here is that any risk with a RCI greater than 0.5 are said to be critical; meaning that they are likely to occur and have a severe impact if they occur. Moreover, any risk factor with a RCI of less than 0.5, but not less than 0.3, are said to be somehow critical. The implication of this is that these risk factors are slightly likely to occur; and when they occur they have a substantial impact on the project.

Table 7.10 has shown that 15 out of the 68 risk factors (i.e. 24 exogenous and 44 endogenous) were critical to PPP projects; whilst the remaining 53 were somehow critical. None of the risk factors were rated below a RCI of 0.3 which implied that all the identified risk factors were slightly likely to occur; and when they occurred they would have an impact ranging from a marginal impact to a severe impact on the project. This finding has concurred with the findings of Zou *et al..,* (2008) and Chan and Cheung (2011) when they attempted to understand the risks within China's PPP projects.

It is interesting to see that in Table 7.10 unstable government; availability of finance; construction cost overrun; corruption and lack of respect for law and lack of commitment from public/private partner were the top five critical risks. These risk factors had a RCI ranging from 0.62 and 0.57. This can however be explained. Take for example, unstable government, as previously discussed, when there has been a change in government, the successive government jettisons the ideas of their predecessor and formulates a new policy, which may not favour the existing commitment of the previous government. This can ultimately lead to a review of the previous contract or the determination of the contract by the new government which would definitely impact negatively on the project. More so, the construction cost overrun could surely have a serious impact on the PPP projects since the length of the concession would have been tied to the initial investment and the possible period for recovery would be the same. Thus in case there was an overrun in the cost, there would be a likelihood that the operator may want to increase the tariff on the facility which would definitely affect the satisfaction of the users and in turn impact on the success of the project.

Table 7.10: Assessment of criticality of both exogenous and endogenous risk factors.

Risk factor.	Description.	Criticality Index of the significant risk factors using their Probability Impact ratings.							
		Overall ratings from likelihood of occurrence (PR).		Overall ratings from Impact of the Risk (IR).		Risk Criticality Scoring from (PRxIR).		Criticality Index Rating.	
		MS	Ranking	MS	Ranking	RC	Ranking	CI	Remark
V20AEX1	Unstable government.	3.98	2	3.91	1	15.57	1	0.62	*Critical.*
V20AEN6	Availability of finance.	3.81	7	3.78	2	14.41	2	0.58	*Critical.*
V20AEN20	Construction cost overrun.	3.90	4	3.68	7	14.35	3	0.57	*Critical.*
V20AEX13	Corruption and lack of respect for law.	3.84	5	3.73	4	14.32	4	0.57	*Critical.*
V20AEN39	Lack of commitment from public / private partner.	4.05	1	3.53	16	14.30	5	0.57	*Critical.*
V20AEN7	High finance cost.	3.73	9	3.77	3	14.08	6	0.56	*Critical.*
V20AEX4	Strong political opposition/hostility.	3.76	8	3.71	5	13.96	7	0.56	*Critical.*
V20AEN36	Inadequate experience in PPP.	3.83	6	3.62	10	13.87	8	0.55	*Critical.*
V20AEN26	Excessive contract variation.	3.72	10	3.68	7	13.68	9	0.55	*Critical.*
V20AEN21	Construction time overrun.	3.91	3	3.49	18	13.68	9	0.55	*Critical.*
V20AEX5	Inconsistencies in government policies.	3.65	13	3.71	5	13.52	11	0.54	*Critical.*
V20AEN25	Poor quality of workmanship.	3.65	13	3.65	9	13.29	12	0.53	*Critical.*
V20AEX7	Inflation rate volatility.	3.56	16	3.60	11	12.82	13	0.51	*Critical.*
V20AEN14	Bankruptcy of concessionaire.	3.49	21	3.57	13	12.48	14	0.50	*Critical.*
V20AEN8	Lack of creditworthiness.	3.46	23	3.59	12	12.43	15	0.50	*Critical.*
V20AEN31	Low operating productivity	3.71	12	3.24	34	12.01	16	0.48	*Somehow Critical.*
V20AEN35	Life of facility shorter than anticipated.	3.37	28	3.56	15	11.98	17	0.48	*Somehow Critical.*

V20AEX19	Non-involvement of host-community.	3.72	10	3.18	43	11.84	18	0.47	*Somehow Critical.*
V20AEN14	Import/Export restrictions.	3.47	22	3.39	22	11.76	19	0.47	*Somehow Critical.*
V20AEN17	Delay in project approvals and permits.	3.51	19	3.34	27	11.72	20	0.47	*Somehow Critical.*
V20AEN13	Lack of government guarantees.	3.52	18	3.33	30	11.72	20	0.47	*Somehow Critical.*
V20AEX11	Legislation change/inconsistencies.	3.35	30	3.47	19	11.65	22	0.47	*Somehow Critical.*
V20AEN33	Maintenance cost higher than expected.	3.58	15	3.20	40	11.47	23	0.46	*Somehow Critical.*
V20AEN12	Inability to service debt.	3.43	24	3.34	27	11.47	23	0.46	*Somehow Critical.*
V20AEN9	Liquidity.	3.30	35	3.47	19	11.47	23	0.46	*Somehow Critical.*
V20AEX6	Poor financial market.	3.20	42	3.57	13	11.44	26	0.46	*Somehow Critical.*
V20AEN27	Insolvency/default of subcontractors and suppliers.	3.37	28	3.39	22	11.40	27	0.46	*Somehow Critical.*
V20AEN30	Operation cost overrun.	3.56	16	3.18	43	11.33	28	0.45	*Somehow Critical.*
V20AEN24	Late design changes.	3.33	33	3.39	22	11.29	29	0.45	*Somehow Critical.*

V20AEN1	Land acquisition/site availability.	3.51	19	3.20	40	11.23	30	0.45	*Somehow Critical.*
V20AEN38	Inadequate distribution of responsibilities and risks.	3.31	34	3.38	25	11.17	31	0.45	*Somehow Critical.*
V20AEN18	Design deficiency.	3.17	45	3.51	17	11.12	32	0.44	*Somehow Critical.*
V20AEX9	Exchange rate fluctuation.	3.43	24	3.24	34	11.10	33	0.44	*Somehow Critical.*
V20AEX8	Interest rate volatility.	3.34	32	3.30	31	11.04	34	0.44	*Somehow Critical.*
V20AEN32	Maintenance more frequent than expected.	3.30	35	3.34	27	11.04	34	0.44	*Somehow Critical.*
V20AEX3	Poor public decision making process.	3.40	27	3.22	37	10.92	36	0.44	*Somehow Critical.*
V20AEN15	Financial attraction of project to investors.	3.35	30	3.24	34	10.86	37	0.43	*Somehow Critical.*
V20AEX10	Influential economic event (boom/recession).	3.26	39	3.28	33	10.69	38	0.43	*Somehow Critical.*
V20AEN29	Operational revenue below projection.	3.08	51	3.46	21	10.65	39	0.43	*Somehow Critical.*
V20AEN11	High bidding costs.	3.41	26	3.11	47	10.59	40	0.42	*Somehow Critical.*
V20AEN19	Unproven engineering techniques.	3.13	48	3.35	26	10.50	41	0.42	*Somehow Critical.*
V20AEN2	Level of demand for the project.	3.24	40	3.20	40	10.37	42	0.41	*Somehow*

									Critical.
V20AEN37	Organisation and coordination risk.	3.14	46	3.30	31	10.36	43	0.41	*Somehow Critical.*
V20AEN4	Competition risk.	3.28	38	3.14	45	10.30	44	0.41	*Somehow Critical.*
V20AEN10	Depository.	3.14	49	3.22	37	10.09	45	0.40	*Somehow Critical.*
V20AEX18	Public opposition to projects.	3.23	41	3.09	48	9.95	46	0.40	*Somehow Critical.*
V20AEX2	Possible expropriation/ nationalisation of assets.	3.29	37	2.98	56	9.80	47	0.39	*Somehow Critical.*
V20AEN28	Risk regarding pricing of product/service.	3.02	57	3.22	37	9.71	48	0.39	*Somehow Critical.*
V20AEN5	Fault in tender specification.	3.09	49	3.12	46	9.62	49	0.38	*Somehow Critical.*
V20AEN3	Prolonged negotiation period prior to initiation.	3.19	43	2.99	54	9.55	50	0.38	*Somehow Critical.*
V20AEN34	Competitive market (a product with a close substitute).	3.04	54	3.08	49	9.36	51	0.37	*Somehow Critical*
V20AEN41	Different working methods/know-how. between partners.	3.09	49	3.02	52	9.32	52	0.37	*Somehow Critical*
V20AEN22	Availability of appropriate labour/material.	3.03	56	3.05	51	9.26	53	0.37	*Somehow Critical*
V20AEN42	Counter party's creditworthiness.	3.02	57	3.02	52	9.13	54	0.37	*Somehow Critical*

V20AEN40	Inadequate distribution of authority between partners.	3.18	44	2.85	63	9.07	55	0.36	*Somehow Critical*
V20AEX24	Geotechnical conditions.	3.06	52	2.89	61	8.86	56	0.35	*Somehow Critical*
V20AEX12	Change in tax regulation.	2.88	65	3.06	50	8.83	57	0.35	*Somehow Critical*
V20AEN43	Staff crises.	2.94	62	2.99	54	8.77	58	0.35	*Somehow Critical*

V20AEN23	Manpower problem associated with trade unions.	3.00	59	2.90	60	8.71	59	0.35	*Somehow Critical.*
V20AEX17	Lack of tradition of private provision of public services.	2.95	61	2.94	57	8.65	60	0.35	*Somehow Critical.*
V20AEX21	Force majeure.	3.04	54	2.81	64	8.54	61	0.34	*Somehow Critical.*
V20AEN16	Residual value (after concession period).	2.90	63	2.94	57	8.52	62	0.34	*Somehow Critical.*
V20AEX22	Weather.	3.00	59	2.81	64	8.42	63	0.34	*Somehow Critical.*
V20AEN44	Third party tort liability.	2.87	66	2.89	61	8.30	64	0.33	*Somehow Critical.*
V20AEX20	Cultural differences between main stakeholders.	3.06	52	2.71	67	8.30	64	0.33	*Somehow Critical.*
V20AEX23	Environment.	2.89	64	2.67	68	7.71	66	0.31	*Somehow Critical.*
V20AEX16	Industrial regulation change.	2.72	67	2.74	66	7.46	67	0.30	*Somehow Critical.*
V20AEX15	Rate of returns restrictions.	2.56	68	2.91	59	7.46	67	0.30	*Somehow Critical.*

7.8 Assessment of allocation preferences for the identified risk events

This section has presented the results of opinions expressed by respondents on risk allocation preferences. The idea here is that risk should be allocated to the party who can manage it the most effectively. To determine therefore, the preferred risk allocation options, the respondents were asked to provide a score from 3 to 1 whereby 1 represented allocation to the public; 2 allocation to private; and 3 risk to be shared by both parties. Appendix L_i and L_{ii} have provided the results of the responses across groups for exogenous and endogenous risk factors respectively and the Kruskal-Wallis Test results for each factor. The overall MS have been provided in Table 7.11. It is evident from the table that 10 out of the 24 external risks were to be shared by both the public and private partners; whilst 6 were allocated to the public sector and the private partners and were responsible for the remainder of the 8 risk events. It is interesting to note that the result of the Chi-Square value and the Kruskal-Wallis Test revealed a strong agreement in the opinion of respondents across groups as none of the factors had a Sig.p value of less than 0.05.

Table 7.11: Exogenous risk factors allocation preferences.

Exogenous Risk Factor.	**Description.**	**Risk allocation preferences.**			
		Overall rating.		**Chi-Square Value.**	**Kruskal Wallis Sig p.**
		MS	**Allocate**		
V20CEX10	Influential economic event (boom/recession).	3.00	shared	0.00	1.000
V20CEX20	Cultural differences between main stakeholders.	3.00	shared	0.00	1.000
V20CEX23	Environment.	3.00	shared	0.00	1.000
V20CEX18	Public opposition to projects.	2.91	shared	3.88	0.275
V20CEX21	Force majeure.	2.91	shared	3.88	0.275
V20CEX13	Corruption and lack of respect for law.	2.83	shared	3.88	0.275
V20CEX22	Weather.	2.80	shared	3.05	0.384
V20CEX24	Geotechnical conditions.	2.74	shared	2.88	0.410
V20CEX6	Poor financial market.	2.66	shared	3.45	0.327
V20CEX15	Rate of returns restrictions.	2.57	shared	4.16	0.244
V20CEX3	Poor public decision making process.	2.48	Private	2.88	0.410
V20CEX19	Non-involvement of host-community.	2.46	Private	3.04	0.386
V20CEX4	Strong political opposition/hostility.	2.31	Private	3.90	0.272
V20CEX9	Exchange rate fluctuation.	2.10	Private	1.73	0.631
V20CEX2	Possible expropriation/ nationalisation of assets.	2.03	Private	1.73	0.630

V20CEX17	Lack of tradition of private provision of public services.	2.01	Private	2.26	0.520
V20CEX7	Inflation rate volatility.	1.89	Private	2.59	0.459
V20CEX8	Interest rate volatility.	1.89	Private	2.59	0.459
V20CEX16	Industrial regulation change.	1.29	Public	0.70	0.873
V20CEX1	Unstable government.	1.00	Public	0.00	1.000
V20CEX5	Inconsistencies in government policies.	1.00	Public	0.00	1.000
V20CEX11	Legislation change/inconsistencies.	1.00	Public	0.00	1.000
V20CEX12	Change in tax regulation.	1.00	Public	0.00	1.000
V20CEX14	Import/Export restrictions.	1.00	Public	0.00	1.000

Table 7.12: Endogenous risk factors allocation preferences.

Endogenous Risk Factor.	**Description.**	**Risk allocation preferences.**			
		Overall Rating.		**Chi-Square Value.**	**Kruskal Wallis Sig p.**
		MS	**Allocate**		
V20CEN3	Prolonged negotiation period prior to initiation.	3.00	Shared	0.00	1.000
V20CEN36	Inadequate experience in PPP.	3.00	Shared	0.00	1.000
V20CEN39	Lack of commitment from public/private partner.	3.00	Shared	0.00	1.000
V20CEN16	Residual value (after concession period).	2.91	Shared	3.88	0.275
V20CEN26	Excessive contract variation.	2.91	Shared	0.54	0.911
V20CEN42	Counter party's creditworthiness.	2.91	Shared	3.88	0.275
V20CEN38	Inadequate distribution of responsibilities and risks.	2.83	shared	3.45	0.327
V20CEN40	Inadequate distribution of authority between partners.	2.83	Shared	3.45	0.327
V20CEN41	Different working methods/know-how between partners.	2.83	Shared	3.45	0.327
V20CEN15	Financial attraction of project to investors.	2.80	Shared	3.05	0.384
V20CEN20	Construction cost overrun.	2.74	Shared	3.33	0.343
V20CEN21	Construction time overrun.	2.74	Shared	3.33	0.343
V20CEN44	Third party tort liability.	2.66	Shared	3.90	0.272
V20CEN6	Availability of finance.	2.57	Shared	4.16	0.244
V20CEN7	High finance cost.	2.57	Shared	4.16	0.244
V20CEN2	Level of demand for the project.	2.54	Shared	3.04	0.386
V20CEN24	Late design changes.	2.46	Private	3.04	0.386
V20CEN29	Operational revenue below projection.	2.38	Private	0.35	0.951
V20CEN30	Operation cost overrun.	2.38	Private	0.35	0.951
V20CEN31	Low operating productivity.	2.38	Private	0.35	0.951
V20CEN35	Life of facility shorter than that anticipated.	2.38	Private	0.35	0.951
V20CEN9	Liquidity.	2.37	Private	1.62	0.654

V20CEN28	Risk regarding pricing of product/service.	2.34	Private	3.90	0.272
V20CEN14	Bankruptcy of concessionaire.	2.29	Private	0.70	0.873
V20CEN19	Unproven engineering techniques.	2.29	Private	0.70	0.873
V20CEN22	Availability of appropriate labour/material.	2.29	Private	0.70	0.873
V20CEN23	Manpower problem associated with trade unions.	2.29	Private	0.70	0.873
V20CEN32	Maintenance more frequent than expected.	2.29	Private	1.21	0.750
V20CEN33	Maintenance cost higher than expected.	2.29	Private	1.21	0.750
V20CEN4	Competition risk.	2.25	Private	1.53	0.675
V20CEN18	Design deficiency.	2.20	Private	3.05	0.384
V20CEN27	Insolvency/default of subcontractors and suppliers.	2.20	Private	3.05	0.384
V20CEN37	Organisation and coordination risk.	2.20	Private	3.05	0.384
V20CEN10	Depository.	2.12	Private	5.14	0.162
V20CEN25	Poor quality of workmanship.	2.00	Private	0.00	1.000
V20CEN34	Competitive market (a product with a close substitute).	2.00	Private	3.38	0.337
V20CEN43	Staff crises.	2.00	Private	0.00	1.000
V20CEN5	Fault in tender specification.	1.91	Private	3.88	0.275
V20CEN8	Lack of creditworthiness.	1.91	Private	3.88	0.275
V20CEN11	High bidding costs.	1.81	Private	2.63	0.452
V20CEN12	Inability to service debt.	1.71	Private	0.70	0.873
V20CEN17	Delay in project approvals and permits.	1.41	Public	3.05	0.384
V20CEN1	Land acquisition/site availability.	1.09	Public	3.88	0.275
V20CEN13	Lack of government guarantees.	1.00	Public	0.00	1.000

Moreover, under endogenous risk events, respondents stated that 25 out of the 44 internal risk events should be allocated to the private partners; 16 should be shared between the private and the public partners and 3 should be allocated to the public sector. It was also evident that there was strong agreement amongst respondents across groups as none of the risk factors had a significant p. value less than 0.05. Table 7.13 has provided a summary of the allocation preferences as expressed by respondents. Overall, nine (9) risk events were allocated to the public sector as follows: (i) Industrial regulation change; (ii) Unstable government; (iii) Inconsistencies in government policies; (iv) Legislation change/inconsistencies; (v) Change in tax regulation; (vi) Import/Export restrictions; (vii) Delay in project approvals and permits; (viii) Land acquisition/site availability; and (ix) Lack of government guarantees.

This finding has concurred with the findings of Ibrahim *et al..,* (2006) who found that respondents preferred to allocate eight risk factors to the public sector. However, a poor public decision making process, which was amongst the eight risk factors allocated to the public sector, was allocated to the private sector in this study. The argument respondents advanced for this was that there was a private need to take note of this from the outset and that such bureaucracy involved in the public sector decision making process should be factored in. Furthermore, in their study, industrial regulation changes, which were part of the risk events allocated to the public sector in this study, were under project dependent. Nevertheless, the study appeared to concur in many ways. Firstly, the majority of these risk factors were external to the project and fell directly within the remit of the government policy group; or were such that government was deemed to be in the best position to manage them.

Secondly, in this study, respondents allocated greater parts of identified risk factors to the private sector followed by those to be shared by both parties. In all, 33 risk factors were allocated to the private sector; whilst 26 were to be shared between private and public partners. These results also corroborate previous findings of Zhang *et al..,* (1998) and Li *et al..,* (2005) carried out in Hong Kong and UK respectively. Moreover, it is evident that while the majority of endogenous risk factors (i.e. risk factors that are internal to the project) were allocated to the private sector by respondents; greater parts of exogenous risk factors were allocated to the public sector or to be shared by both parties.

Table 7.13: Summary of risk allocation preferences

S/No.	Allocation to Public.	Allocation to Private.	Shared by both parties.
	Industrial regulation change.	Poor public decision making process.	Influential economic event (boom/recession).
	Unstable government.	Non-involvement of host-community.	Cultural differences between main stakeholders.
	Inconsistencies in government policies.	Strong political opposition/hostility.	Environment.
	Legislative change/inconsistencies.	Exchange rate fluctuation.	Public opposition to projects.
	Change in tax regulation.	Possible expropriation/nationalisation of assets.	Force majeure.
	Import/Export restrictions.	Lack of tradition of private provision of public services.	Corruption and lack of respect for law.
	Delay in project approvals and permits.	Inflation rate volatility.	Weather.
	Land acquisition/site availability.	Interest rate volatility.	Geotechnical conditions.

Lack of government guarantees.	Late design changes.	Poor financial market.
	Operational revenue below projection.	Rate of return restrictions.
	Operation cost overrun.	Prolonged negotiation period prior to initiation.
	Low operating productivity.	Inadequate experience in PPP.
	Life of facility shorter than that anticipated.	Lack of commitment from public/private partner.
	Liquidity.	Residual value (after concession period).
	Risk regarding pricing of product/service.	Excessive contract variation.
	Bankruptcy of concessionaire.	Counter party's creditworthiness.
	Unproven engineering techniques.	Inadequate distribution of responsibilities and risks.
	Availability of appropriate labour/material.	Inadequate distribution of authority between partners.
	Manpower problem associated with trade unions.	Different working methods/know-how between partners.
	Maintenance more frequent than expected.	Financial attraction of project to investors.
	Maintenance cost higher than expected.	Construction cost overrun

	Competition risk. Design deficiency. Insolvency/default of subcontractors and suppliers. Organisation and coordination risk. Depository. Poor quality of workmanship. Competitive market (a product with a close substitute). Staff crises. Fault in tender specification. Lack of creditworthiness. High bidding costs. Inability to service debt.	Construction time overrun. Third party tort liability. Availability of finance. High finance cost. Level of demand for the project.

7.9 Assessment of effectiveness of risk mitigation measures

Having assessed the criticality of the identified risk factors and risk allocation preference from the opinions of respondents, respondents were also asked to assess the effectiveness of the mitigation measures identified from the literature and discussion with experts in PPP projects. This section therefore presents the result of the opinions expressed by respondents using a scale of 1-5 whereby 1 represents not effective and 5 represents very effective. Table 7.14 has revealed respondents' assessment of the 37 mitigation measures identified from the literature. It is obvious from the results that although, all the identified risk mitigation measures from the opinions of respondents could be said to be effective; this has been in varying degrees. For instance while 28 out of 37 were ranked as being effective respondents ranked 9 measures as somehow effective. From the table, the first ten effective risk mitigation measures for the PPP market project in Nigeria were as follows: (i) Ensuring that the project complies with the local development plan; (ii) Proper measurement and accurate pricing of Bills of Quantities at the bidding stage; (iii) Ensuring that the approval is sought at the right local government departments; (iv) Obtaining payment and performance bonds from local and international banks; (v) Maintaining a good relationship with local government and higher officials; (vi) Include clauses for delays and additional payments in the contract, which occur due to new rules or changes in the law; (vii) Obtain all necessary approvals in a timely manner to minimise the chance for corrupt individuals to obstruct work; (viii) Develop a clear and appropriate plan and control the schedule and cost; (ix) Undertake pre-project planning to minimise design errors; and (x) Provide dispute settlement clauses in the contract.

Furthermore, amongst the risk mitigation measures that were ranked by respondents to be somehow effective these included: (a) Gaining accurate financial and other information from international and independent security and risk evaluation agencies; (b) Hiring company's own competent native language-speaking employee, even though some of the staff understand the native language; and (c) Establishing agreement with local government agency to reduce/exempt from import formalities etc. All these aforementioned effective mitigation measures would appear to concur with the previous opinions expressed by respondents with regards to the risks that should be allocated to the private sector. Thus, it is evident from Table 7.14 that the majority of the mitigation measures that were stated to be effective were related to some of the precautionary steps private partners had to take when entering into partnership with the public sector in

order to safe guide against the occurrence of these risks factors. Thus it subsequently follows that for the private sector that have been allocated significant risk; greater mitigation measures are therefore suggested to help them mitigate these risk factors *Ab initio*. For instance, the issues like non-involvement of host-community; strong political opposition/hostility; fault in tender specification and manpower problem associated with trade unions, which are some of the risk factors allocated to the private sector, could be well managed or mitigated against by ensuring that approval had been sought from the suitable local government departments; that the measurement and pricing of bills of quantities at bidding stage had been accurately facilitated and that the hiring of the company's own competent native language-speaking employees had taken place, even though some of the staff may actually have had an understanding of the native language; all of which are considered part of effective mitigation measures.

Table 7.14: Assessing the effectiveness of risk mitigation measures.

Variable coding.	**Effectiveness of risk mitigation measures.**					
	Description of the mitigation measures.	**Overall rating.**		**Chi-Square Value.**	**Kruskal Wallis Sig p.**	**Remark.**
		MS	**Ranking**			
VRM21	Ensure the project complies with the local development plan.	4.18	1	15.993	0.001	*Effective.*
VRM45	Measure and price Bills of Quantities properly during the bidding stage.	4.14	2	7.602	0.055	*Effective.*
VRM25	Ensure the approval is sought at the right local government departments.	4.04	3	4.442	0.218	*Effective.*
VRM47	Obtain payment and performance bonds from local and international banks.	4.04	3	15.694	0.001	*Effective.*
VRM22	Maintain good relationship with local government and higher officials.	3.98	5	1.798	0.615	*Effective.*
VRM24	Include clauses for delays and additional payments in contract, which occur due to new rules or change in the law.	3.96	6	8.325	0.040	*Effective.*
VRM27	Obtain all necessary approvals in a timely manner to minimise chance for corrupt individuals to obstruct work.	3.94	7	3.592	0.309	*Effective.*
VRM46	Develop a clear and appropriate plan and control schedule and cost.	3.92	8	27.606	0.000	*Effective.*
VRM50	Undertake pre-project planning to minimise design errors.	3.91	9	5.639	0.131	*Effective.*
VRM36	Provide dispute settlement clauses in the contract.	3.84	10	18.679	0.000	*Effective.*
VRM28	Develop contingency plans and obtain insurance for expropriation.	3.78	11	3.255	0.354	*Effective.*
VRM31	Insist on having trustworthy people at key places within the JV.	3.78	11	7.629	0.054	*Effective.*
VRM56	Conduct a market study and obtain exact information of competitive projects.	3.77	13	2.676	0.444	*Effective.*

VRM52	Adopt Design and Build option which enables contractor to design in harmony with site conditions thus minimising design/drawing disputes.	3.75	14	30.852	0.000	*Effective.*
VRM53	Insure all of the insurable force majeure risks.	3.74	15	10.493	0.015	*Effective.*
VRM40	Offer training to new and existing staff.	3.73	16	6.536	0.088	*Effective.*
VRM32	Establish JV with local partners especially the central local government agencies or state owned enterprises.	3.69	17	4.496	0.213	*Effective.*
VRM23	Obtain insurance for political risks.	3.68	18	18.790	0.000	*Effective.*
VRM48	Enter into fixed rate loan contract with lending banks.	3.68	18	24.199	0.000	*Effective.*
VRM51	Get Design liability insurance.	3.63	20	9.791	0.020	*Effective.*
VRM26	Try to work directly with the business connections, i.e. do not hire a broker or middleman.	3.60	21	14.183	0.003	*Effective.*
VRM44	Secure standby cash flow in advance.	3.60	21	1.825	0.609	*Effective.*
VRM30	Pay careful attention to contract translation.	3.58	23	24.723	0.000	*Effective.*
VRM37	Only take over the local partner's competent staff when merging with the partner or during the contract process.	3.58	23	13.084	0.004	*Effective.*
VRM54	Obtain local government guarantee to adjust tariff or extend concession period.	3.57	25	16.972	0.001	*Effective.*
VRM55	Employ reputable third party consultant to forecast market demand.	3.56	26	13.605	0.003	*Effective.*

VRM29	Develop own contingency for possible political instability, such as plan for emergency evacuation.	3.54	27	25.791	0.000	*Effective.*
VRM49	Adopt as much as possible domestic product/labour to reduce cost.	3.52	28	26.154	0.000	*Effective.*
VRM41	Gain accurate financial and other information from international and independent security and risk evaluation agencies.	3.49	29	9.305	0.026	*S/Effective.*
VRM35	Hire company's own competent native language-speaking employees, even though some of the staff may understand the native language.	3.46	30	2.814	0.421	*S/Effective.*
VRM38	Sign formal employment contract with every staff member.	3.44	31	15.252	0.002	*S/Effective.*
VRM57	Establish agreement with local government agency to reduce/exempt from import formalities.	3.43	32	8.435	0.038	*S/Effective.*
VRM42	Get Letter of Credit from local government.	3.35	33	14.157	0.003	*S/Effective.*
VRM39	Decide on recruitment and selection criteria in consultation with one local partner.	3.32	34	5.854	0.119	*S/Effective.*
VRM33	Transfer ordinary technology only but keep the key ones.	3.29	35	13.336	0.004	*S/Effective.*
VRM43	Adopt alternatives to contract payment, e.g. land development rights and resource swap.	3.19	36	10.109	0.018	*S/Effective.*
VRM34	Study carefully the differential taxation and find legal and reasonable measures to reduce taxes.	3.17	37	4.478	0.214	*S/Effective.*

7.10 Assessment of stakeholder's satisfaction with PPP markets

One of the objectives of this study has been to evaluate the impact of risk factors with regards to stakeholder's satisfaction with PPP market projects. As discussed earlier in the previous chapter, in order to achieve this objective, a separate set of questionnaires were designed for the traders and shoppers to assess their levels of satisfaction. In addition to this, documentary evidence was reviewed in order to determine the magnitude of the impact of these risk factors with regards to time and cost performance of these market projects. Furthermore, interviews were conducted with the primary stakeholders within these market projects to elicit information about their general levels of satisfaction. This section has presented the results of the questionnaires administered to the end users (i.e. the traders and the shoppers) to the market.

It must be mentioned that the questionnaires were only administered to the shoppers and traders within the reconstruction of Erekesan Market in Akure; whilst formal and informal interviews were conducted with key stakeholders and end users on all of the three case studies. The reason for this was that up until December 2010, few traders were seen in the other two case studies (i.e. Ikeja Canntonment and Oluwole market); and only a selected few shoppers were met in the market. This was due to the fact that these markets had just been commissioned and traders and buyers were just coming in to them. Due to the small size of this sample of respondents, interviews were conducted with those who had agreed to be interviewed. The results of the findings from this series of interviews and informal discussions with the buyers have been presented in the next chapter (Chapter 8) which deals with the qualitative strand of the analysis. Out of 200 questionnaires distributed between the shoppers and traders within Erekesan market (i.e. 100 of each) 54 questionnaires out of those administered to the traders were properly completed and were considered fit for analysis; whilst 82 from the sample of shoppers were considered fit for analysis. These represented a 54% and 82% response rate respectively. The results from these questionnaires have been presented in the following sections.

7.10.1 Assessment of traders' level of satisfaction with Erekesan market

Figures 7.4 - 7.7 have shown the general background information regarding the traders who responded to the questionnaire. This was important in order to assess the reliability and the validity of information gathered from such a sample of respondents. In Figure 7.4, 89% of the traders had experienced a trading opportunity in other markets, either within the governments' own markets or community markets before coming to sell/trade in the PPP market project; whilst only 11% stated they had not traded previously in other markets before coming to trade in the PPP market. Similarly, when asked about how frequently they had used the market, Figure 7.5 revealed that 68.5% of the traders had used the market frequently; whilst 31.5% had used it very frequently. In addition, in Figure 7.6, 45% of the traders had been using the market for more than 5 years; whilst 55% asserted that they have been using the market for close to 5 years. This has implied that all respondents had a good knowledge of the market to be able to comment adequately on it; and they were also knowledgeable enough to respond to the questions in the questionnaire with little assistance from the field assistants. Moreover, their length of use of the market made it possible for them to compare the existing facilities in the new market with the old market before they were redeveloped using the PPP model.

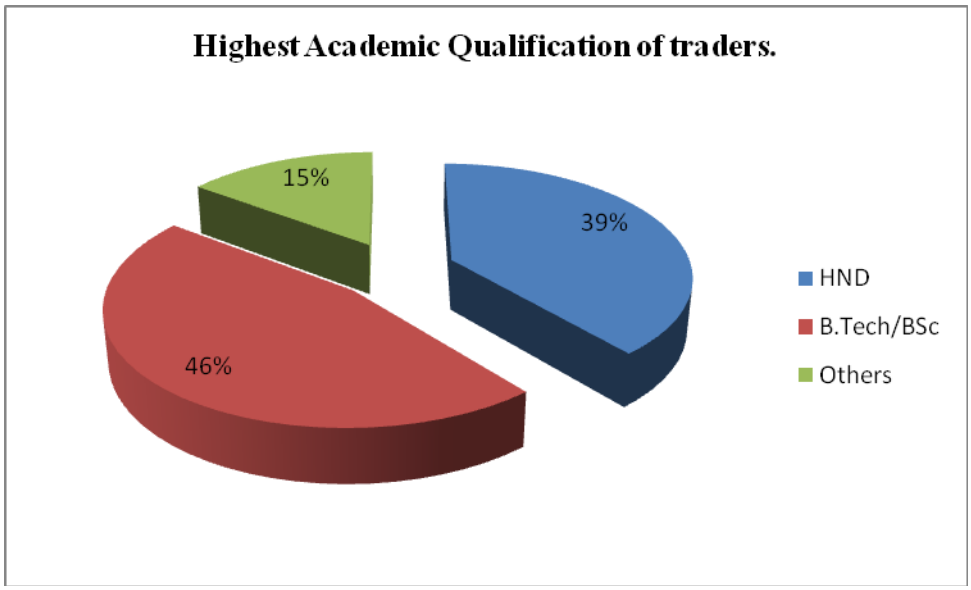

Figure 7.4: Highest academic qualifications of traders.

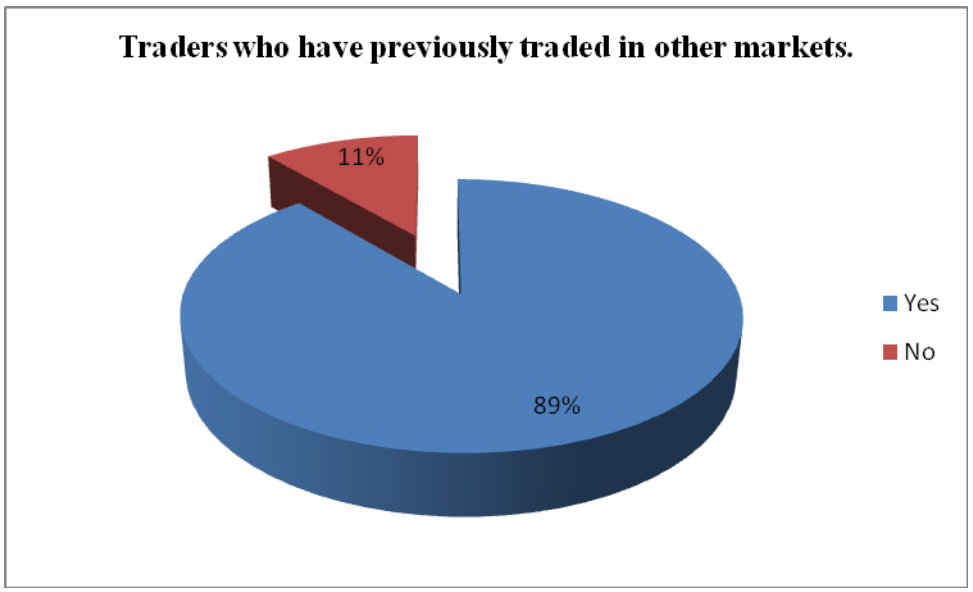

Figure 7.5: Traders who have previously traded in other markets.

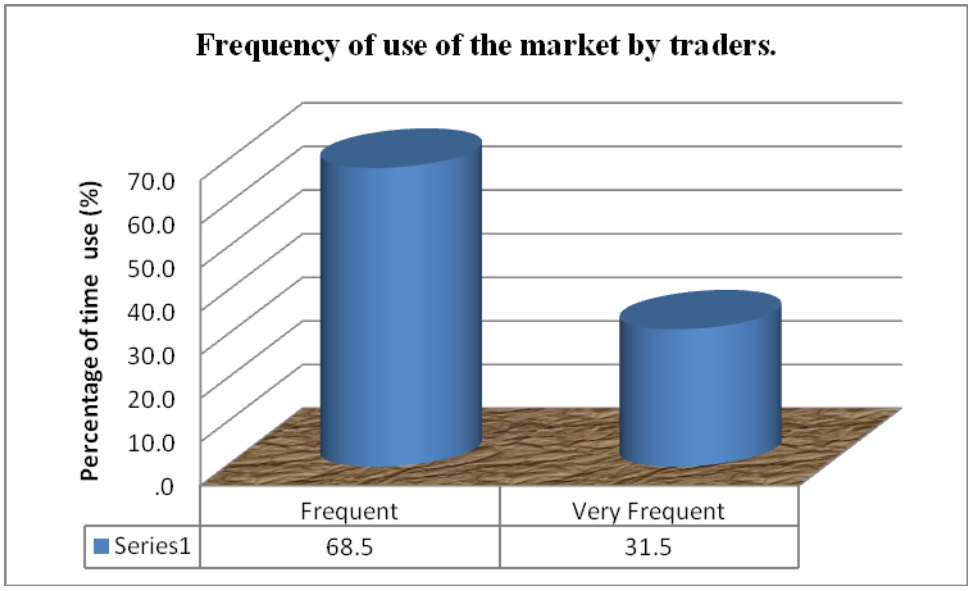

Figure 7.6: Frequency of use of the market by traders.

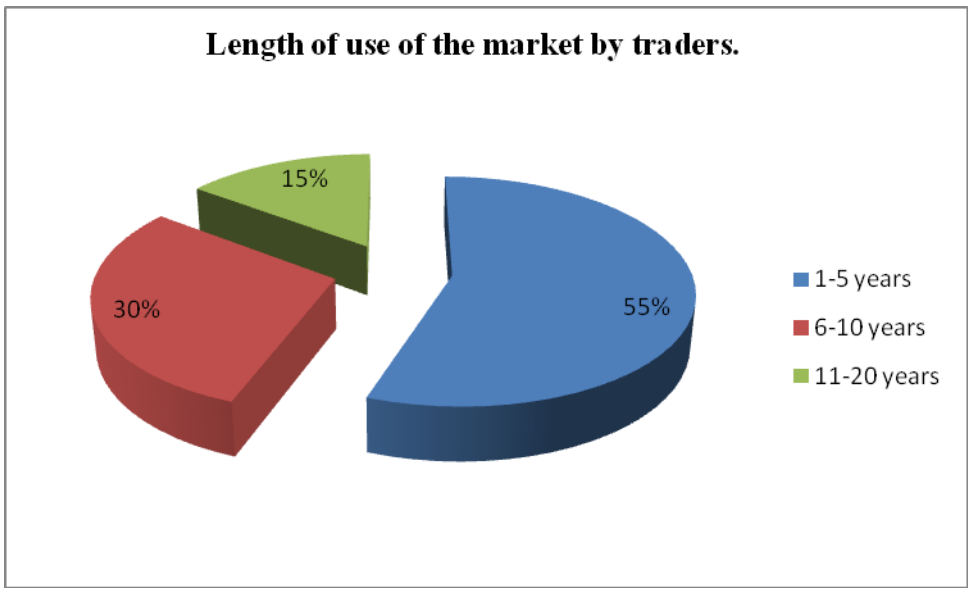

Figure 7.7: Length of use of the market by traders.

Following the obtaining of background information about traders, they were then asked to signify their level of satisfaction about the market. Table 7.15 has shown the opinion of traders with regards to their level of satisfaction with the new market facility developed using the PPP model. From the table it is evident that traders were satisfied with: (i) The level of security in and around the market; (ii) The parking places; (iii) The general neatness of the market; (iv) Appropriateness of the size of the facility; (v) Ease of transporting goods in and out of the facility; (vi) The response to maintenance issues by the Facility Manager; (vii) The environment around the facility; and (viii) The attractiveness and accessibility of the facility. Nevertheless, they expressed dissatisfaction with the look of the facility, which they claimed was not as modern as they had expected it to be; and were dissatisfied with the amount they had had to pay for a space in the new market facility.

Table 7.15: Assessment of trader's satisfaction with the new market facility.

Coding	Dimensions	MS	Std. Deviation	Remark
v1k	Security in and around the market.	3.46	1.73	*S.Satisfied.*
v1h	Adequacy of parking spaces.	3.37	1.56	*S.Satisfied.*
v1m	General neatness of the market.	3.35	1.66	*S.Satisfied.*
v1f	Appropriateness of the size of the facility.	3.30	1.06	*S.Satisfied.*
v1g	Ease of transporting goods in and out of the facility.	3.26	1.52	*S.Satisfied.*
v1L	Response to maintenance issues by the Facility Manager.	3.09	1.56	*S.Satisfied.*
v1j	The environment around the facility.	2.98	1.72	*S.Satisfied.*
v1c	Attractiveness of the facility.	2.87	1.40	*S.Satisfied.*
v1b	Accessibility of the facility.	2.57	1.51	*S.Satisfied.*
v1d	Ease of locating what you are selling by the buyer.	2.09	1.23	*Dissatisfied.*
v1e	Modern look of the facility.	2.09	1.15	*Dissatisfied.*
v1a	Amount paid for the facility.	2.00	1.21	*Dissatisfied.*

Table 7.16: Comparing trader's satisfaction between the old and new market facility.

Coding.	Dimensions.	MS.	Std. Deviation.	Remark.
v2k	Security in and around the market.	3.70	0.72	*Satisfied.*
v2m	General neatness of the market.	3.70	0.72	*Satisfied.*
v2b	Accessibility of the facility.	3.43	0.90	*S.Satisfied.*
v2j	The environment around the facility.	3.39	0.74	*S.Satisfied.*
v2c	Attractiveness of the facility.	3.26	0.89	*S.Satisfied.*
v2L	Response to maintenance issues by the Facility Manager.	3.06	1.17	*S.Satisfied.*
v2g	Ease of transporting goods in and out of the facility.	2.83	0.64	*S.Satisfied.*
v2f	Appropriateness of the size of the facility.	2.74	1.05	*S.Satisfied.*
v2e	Modern look of the facility.	2.63	0.85	*S.Satisfied.*
v2h	Adequacy of parking spaces.	2.17	1.26	*Dissatisfied.*
v2d	Ease of locating what you are selling by the buyer.	1.94	1.17	*Dissatisfied.*
v2a	Amount paid for the facility.	1.80	1.09	*Dissatisfied.*
v6	Overall satisfaction with the market.	1.11	0.32	*H.Dissatisfied.*

Furthermore, traders were asked to compare the new market as developed using the PPP model with the old market which was solely publically funded. It is evident from Table 7.16 that whilst the traders were satisfied with the security in and around the market; the general neatness of the market; accessibility of the market; the environment in and around the facility; its attractiveness and the response of the Facility Manager towards maintenance issues they were however dissatisfied with its ease of location, what they were selling by prospective buyers and the amount they were having to pay for a space in the new market when compared with the old market. The fact that traders were satisfied with the new facility may not be unconnected to the fact that the new facility using the PPP model now included facilities such as a banking system, water supply, dedicated electricity line and on-site Maintenance Managers to manage the facility, all of which were not present in the old market. Moreover, traders also claimed that whereas, the old design had consisted of a single story block of lock up shops that were open outside with access to the road; they were not satisfied with the new design as it was not considered to be user friendly. They complained that the whole market place

was just an enclosure which made it difficult for prospective buyers to find or locate what they were selling. In addition, they argued that even when potential customers knew where to buy what they wanted; the new design on two floors, made it stressful for potential customers to climb up to the second floor in order to support their businesses.

Furthermore, since traders appeared to be satisfied with some aspects of the new market and felt dissatisfied with other aspects, traders were subsequently asked to express their overall satisfaction with the new market when it was developed using the PPP arrangement. Table 7.16 has revealed that traders expressed general dissatisfaction with the new market project when compared with the old market. Respondents provided a MS of 1.11 which has implied highly dissatisfied when adhering to the 5 point Likert scale employed in the study. They argued that the price they had to pay for a space in the market was too much when compared to what they had previously been paying. Moreover, they added that they would not pay a higher price for a space in the market if they were receiving commensurate sales at the market. In addition because of the unfriendly design, prospective customers were finding it much more difficult to locate what they were actually selling. Thus at the end of the month traders were not generating sufficient sales to warrant the additional expenditure for the space.

7.10.2 Assessment of shoppers' level of satisfaction with the Erekesan market

The satisfaction level of shoppers with the market was also assessed. Before assessing their level of satisfaction, background information was elicited about the shoppers using the first part of the questionnaire in order to gain an understanding of their personal experiences, knowledge and their frequency of use. From Figure 7.8, it was obvious that 19%, 37% and 29% of shoppers that responded to the questionnaire had attained a Master's degree, a Bachelor degree and a Higher National Diploma (HND) as their highest academic qualification respectively; whilst 15% of respondents' ticked the 'others' category whereby they specified the attainment of Ordinary level certificates as their highest academic qualification. Furthermore, when asked about how long they had been shopping in the market, Figure 7.9, revealed that 29% of shoppers had been using the market between 11 - 20 years; whilst 71% of respondents asserted that they had been using the market for between 1 – 5 years. In terms of frequency of use, 74.4% of the shoppers signified that they had been using the market frequently. With regards to

background information about shoppers, it could be concluded that they had an adequate knowledge of the market and were knowledgeable enough to express their satisfaction with the facility.

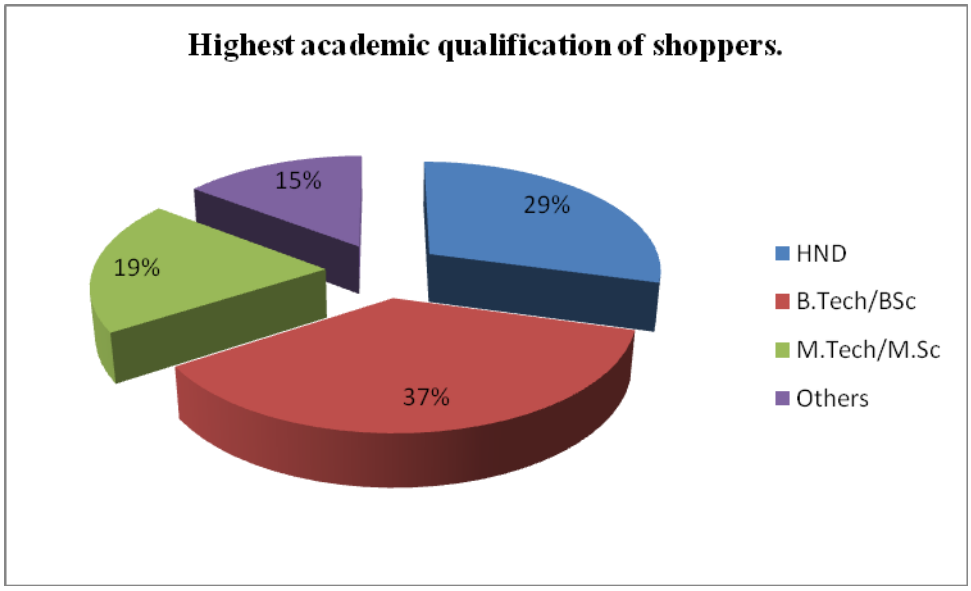

Figure 7.8: Highest academic qualifications of shoppers.

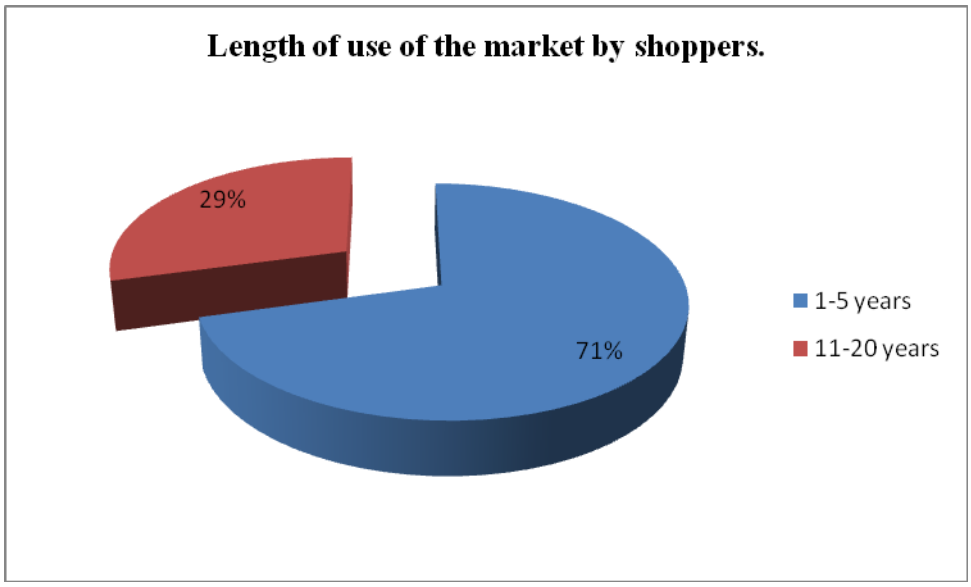

Figure 7.9: Length of use of the market by shoppers.

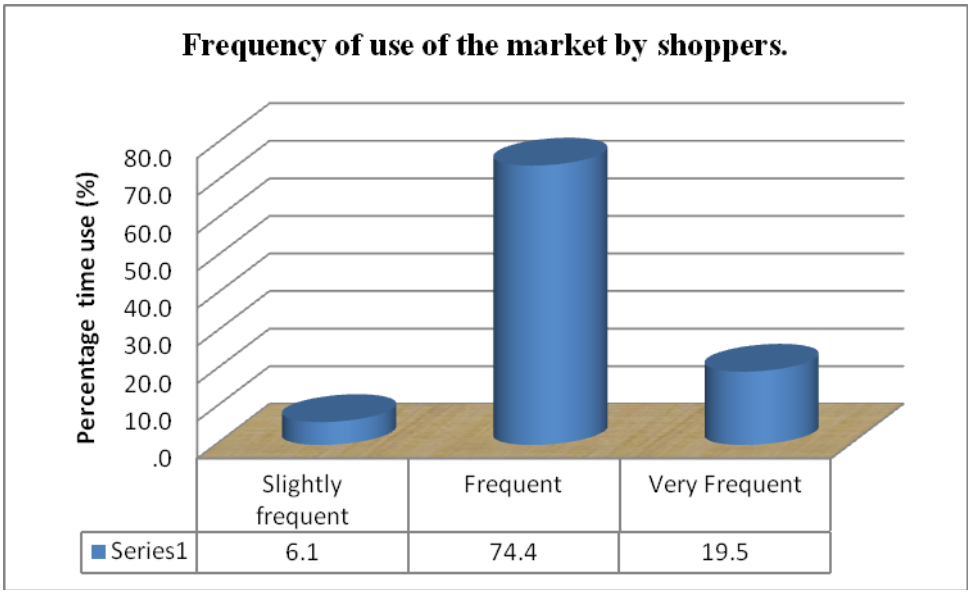

Figure 7.10: Frequency of use of the market by shoppers.

Table 7.17: Assessing shoppers' satisfaction with the new market facility.

Coding.	**Dimensions.**	**MS.**	**Std. Deviation.**	**Remark.**
v1a	Accessibility of the facility.	4.50	0.50	*H. Satisfied.*
v1b	Ease of locating what you want to buy as a customer.	4.05	1.35	*Satisfied.*
v1c	Security in and around the market.	4.05	0.82	*Satisfied.*
v1d	Modern look of the facility.	4.00	0.00	*Satisfied.*
v1e	General neatness of the market.	3.59	1.13	*Satisfied.*
v1f	Attractiveness of the facility.	3.45	0.74	*S.Satisfied.*
v1g	Ease of transporting goods in and out of the facility.	3.29	1.23	*S.Satisfied.*
v1h	Price of goods in the market compared with other places.	2.83	1.52	*S.Satisfied.*
v1j	The environment around the facility.	2.70	1.05	*S.Satisfied.*
v1k	Adequacy of parking spaces.	1.15	0.36	*H.Dissatisfied.*

Table 7.17 has shown the assessment of shoppers' levels of satisfaction within the Erekesan market. From the results, accessibility of the market facility was rated first with a MS of 4.50 which indicated 'highly satisfied'. This was followed by ease of locating what you want to buy as a customer with a MS of 4.05 which indicated 'satisfied'. It is interesting to note that there was a discrepancy in the opinion of traders

and shoppers with regards to this point. Whereas for traders, their satisfaction was rated very low with a MS of 1.23 which indicated 'dissatisfaction', this dimension was rated as 'very high' by shoppers to the market. They argued that due to the layout of the market it was easy for shoppers to locate what the traders were actually selling and the numbering on the shops made it easier for them. This differed from the opinion of the traders who were dissatisfied with this dimension, and they argued that the majority of their customers, because of lack of organisation in terms of grouping people who were selling the same types of goods together in the same part of the market, made it difficult for their customers to come up and visit them; especially those who were positioned within the interior part of the market. Although shoppers to the market could be said to be 'satisfied' with almost all the dimensions assessed, however, 'dissatisfaction' was expressed with regards to the adequacy of parking spaces around in the market.

Shoppers argued that they found it difficult to park very close to the market as all the parking spaces were occupied by the traders themselves. This could be seen as reinforcing the opinion of the traders when they were asked to express their levels of satisfaction with the new market when compared with the old market; and they asserted that they were 'dissatisfied' with the numbers of parking spaces around the market.

Table 7.18: Comparing shoppers' levels of satisfaction between the old and new market facility.

Coding.	**Dimensions.**	**MS.**	**Std. Deviation.**	**Remark.**
v2k	General neatness of the market.	4.37	0.48	*Satisfied.*
v2c	Ease of locating what you want to buy as a customer.	4.34	0.72	*Satisfied.*
v2a	Accessibility of the facility.	4.11	1.37	*Satisfied.*
v2d	Modern look of the facility.	3.84	0.66	*Satisfied.*
v2e	Ease of transporting goods in and out of the facility.	3.67	1.35	*Satisfied.*
v2j	The environment around the facility.	3.50	1.07	*Satisfied.*
v2g	Security in and around the market.	3.39	0.93	*S.Satisfied.*
v2b	Attractiveness of the facility.	3.13	1.06	*S.Satisfied.*
v2h	Price of goods in the market compared with other places.	1.89	1.37	*Dissatisfied.*
v2f	Adequacy of parking spaces.	1.59	1.42	*Dissatisfied.*
v6	Overall satisfaction with the market.	1.55	0.50	*Dissatisfied.*

Moreover, shoppers were asked to express their levels of satisfaction with the new PPP market compared to the old government funded market. Table 7.18 has revealed that shoppers were satisfied with the general neatness of the market; ease of locating what they wanted to buy; accessibility of the facility because of it being located in the centre of the town; the modern look of the facility; ease of transporting goods in and out of the market; and the general environment around the facility. However, they expressed dissatisfaction with the price of goods in the market compared with others stating that goods were a bit more expensive in the new market when compared with the old market. Furthermore, this finding has concurred with the findings of other researchers within marketing research, who have argued that the modern look of a shopping centre, with recreational facilities, car parks etc can help create a niche market and subsequently attract shoppers (Ibrahim and Leng, 2003; Malhotra, 1996 and Nevin and Huston, 1980). In terms of the overall satisfaction of shoppers with regards to the market, the results in Table 7.18 have shown that shoppers were overall dissatisfied with the market.

7.11 Factor Analysis of risk factors in PPP market projects

It must be reiterated that although, all 68 risk factors collated from the literature have been found to be either critical or somehow critical under the ranking or mean score analysis; however the intention of the study has not solely been to generate a list of risks, but also to identify the key risks that could significantly influence the delivery of PPP market projects in Nigeria. Thus, in order to capture any existing multivariate relationship between the risk factors, so as to categorise and classify these risk factors appropriately for successful delivery of PPP market projects in the country, the Factor Analysis (FA) technique was used to investigate the cluster of the relationship. This became necessary due to the difficulty in drawing a distinction between the risk rating for a risk which was highly likely but with a low or little impact; and extremely unlikely but with high impact. This therefore implied that in such a condition, a risk whose impact could be disastrous but extremely unlikely could collapse (i.e. be easily eliminated); or be rated the same as one which was of negligible impact, but highly likely. Moreover, it was evident from the previous analysis that the assessment was based on a numerical severity rating; which bore no relation to the physical severity of the risk in terms of cost or time. They were simply a non-directional score to assist in ranking the risks based on qualitative measures of impact and likelihood.

As discussed earlier in the methodology chapter, the Factor Analysis (FA) which has been carried out has been the Exploratory Factor Analysis (EPA). This is because research on risk in PPP market project continues to evolve especially in the context of the Nigerian construction industry. Therefore, EPA was facilitated to explore the interrelationships among the 68 risk factors identified from the literature. This technique is deemed appropriate because of little '*a priori'* knowledge regarding the number of different cluster relationships to expect; and as the members of these different tendencies were unknown (Hair *et al.*., 1995). The 68 risk factors (i.e. 24 exogenous and 44 endogenous risk factors) were therefore subjected to Factor Reduction Analysis (FRA) using Principal Component Analysis (PCA) and varimax (Orthogonal) rotation of PAWS Statistics 18.

In conducting FA for this study, the three main steps indicated by Pallant (2010) for conducting FA were followed:
Step 1: Assessment of the suitability of the data for FA.
Step 2: Factor extraction.
Step 3: Factor rotation and interpretation. These step by step conducts of the FA have been discussed in turn:

7.11.1: Assessment of the suitability of the data for Factor Analysis

Comparable with the previous analysis whereby Cronbach's Alpha were calculated to prove the reliability of the scale used in the study; the suitability of the data for PCA was carried out using the two issues suggested by Pallant (2010) i.e. (i) the sample size, and (ii) the strength of the relationship among the variables. In term of the sample size, Tabachnick and Fidell (2007) suggested that there should be 150 - 300 within a sample for FA. However, Pallant argued that there had been little agreement amongst authors concerning how large a sample should be; but personally recommended larger samples. As argued in the previous chapter, Akintoye (2000) employed FA for just 84 samples in a comparative study conducted on UK contractors. His argument for a low response rate in Social Science research has been upheld by many researchers (Adnan and Morledge, 2003; Dulami *et al.*., 2003; Ofori and Lean, 2001; Vidogah and Ndekugri, 1998 and Shash, 1993). Moreover, Takim and Adnan (2008) employed FA with a sample size of 93 when analysing the effectiveness measures of construction project success in Malaysia. Thus a sample of 93 could arguably be suitable for this analysis.

Furthermore, Pallant (2010) recommended an inspection of the correlation matrix for evidence of a coefficient greater than 0.3. When the dimension reduction of FA was performed on the 24 exogenous risk factors and 24 endogenous risk factors using the PAWS statistics 18 software; none of the variables had a Measure of Sampling Adequacy (MSA) value of less than 0.500 deemed the minimum acceptable MSA value. (Refer to Appendixes M and N for the MSA value on the diagonal of the matrix for both the exogenous and endogenous risk factors). It has been evident from the Anti-image correlation matrix[a] as presented in these appendixes that the value of the MSA has ranged between 0.519-0.888, and thus has suggested that there was no need to eliminate any factors from the analysis. Nevertheless when the dimension reduction of FA was performed on the remainder of the 20 endogenous risk factors, two risk factors; i.e. competitive market (a product with a close substitute) and inadequate distribution of authority between partners had a MSA of 0.340 and 0.435 respectively which was less than the minimum acceptable MSA. Thus these factors were eliminated from the analysis. (Refer to Appendix O for the MSA value on the diagonal of the matrix).

Moreover, Table 7.19 – 7.20 has shown the KMO MSA and Bartlett's test of sphericity for exogenous and endogenous risk factors. It has been evident from these tables that the KMO values were greater than O.6 which according to Kaiser (1974) was deemed satisfactory for FA. In addition Bartlett's test of sphericity tests the hypothesis that the correlation matrix is an identity matrix. In this study, the value of the test statistic for sphericity for both exogenous and endogenous risk factors were found to be large (i.e. Bartlett's test of sphericity = 1457.134, 1842.729 and 1272.758). This then implied that FA employed in this study was appropriate for factor extraction.

Table 7.19: The results of Kaiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity on exogenous risk factors.

KMO adequacy.	Measure of Sampling.	.730
Bartlett's test of sphericity	Approx. Chi-Square.	1457.134
	df.	210
	Sig.	.000

Table 7.20: The results of Kaiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity on the endogenous risk factors.

KMO adequacy	Measure of Sampling.	.747
Bartlett's test of sphericity.	Approx. Chi-Square.	1842.729
	df.	276
	Sig.	.000

Table 7.21: The results of Kaiser-Meyer-Olkin and Bartlett's test on the endogenous risk factors.

KMO adequacy	Measure of Sampling.	.796
Bartlett's test of sphericity	Approx. Chi-Square.	1272.758
	df.	153
	Sig.	.000

7.11.2: Factor extraction

Having proven that the data for the FA are suitable for the analysis; the next step according to Pallant (2010) is factor extraction. This involves determining the smallest number of factors that can be used to best represent the interrelations among the set of variables. According to Pallant, the most commonly used approach is PCA and that there are a number of techniques that can be used to assist in the decision making process concerning the number of factors to retain, namely: (i) Kaiser's criterion or the Eigenvalue; (ii) The scree test; and (iii) Parallel analysis. In this study therefore, the PCA approach was employed and the results from Kaiser's criterion and the scree test decision criteria were considered when deciding upon the number of factors to be retained. Under Kaiser's criterion or the Eigenvalue, only factors with an Eigenvalue of 1.0 or more are retained for further investigation. Whilst in The scree test, the plot as generated by the SPSS software is inspected to find a point at which the shape of the curve changes direction and becomes horizontal.

In this case, PASW statistics 18 was used to undertake PCA with both the exogenous and endogenous risk factors. Table 7.22 has shown the initial Eigenvalues of the seven extracted factors under exogenous risk factors. According to Kaiser (1974) the Eigenvalue of a factor represented the amount of the total variance explained by that

factor. From this table it is obvious that the total variance explained by the 1st component was 36.141%; while the 7th component explained a total variance of 4.273%. Equally, from Table 7.22, the total variance explained by all of the seven factors extracted from the exogenous risk factors were 78.104%. Pallant (2010) asserted that Kaiser's criterion had been criticised for retaining too many factors in some situations, and therefore to be sure that too many factors had not been retained, scree plot inspection was equally carried out. It is evident from Figure 7.11 that the shape of the curve has changed direction and has become horizontal on the 7th component. This subsequently implied that the seven components extracted could be said to be accurate as there was an agreement between the results of the scree plot and Kaiser's criterion.

Table 7.22: Total variance explained by 7 extracted factors as exogenous risk factors.

	Initial Eigenvalues.			**Extraction Sums of Squared Loadings.**		
Component	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
1.	8.674	36.141	36.141	8.674	36.141	36.141
2.	2.911	12.131	48.272	2.911	12.131	48.272
3.	2.253	9.389	57.660	2.253	9.389	57.660
4.	1.584	6.600	64.261	1.584	6.600	64.261
5.	1.226	5.110	69.371	1.226	5.110	69.371
6.	1.071	4.461	73.832	1.071	4.461	73.832
7.	1.025	4.273	78.104	1.025	4.273	78.104

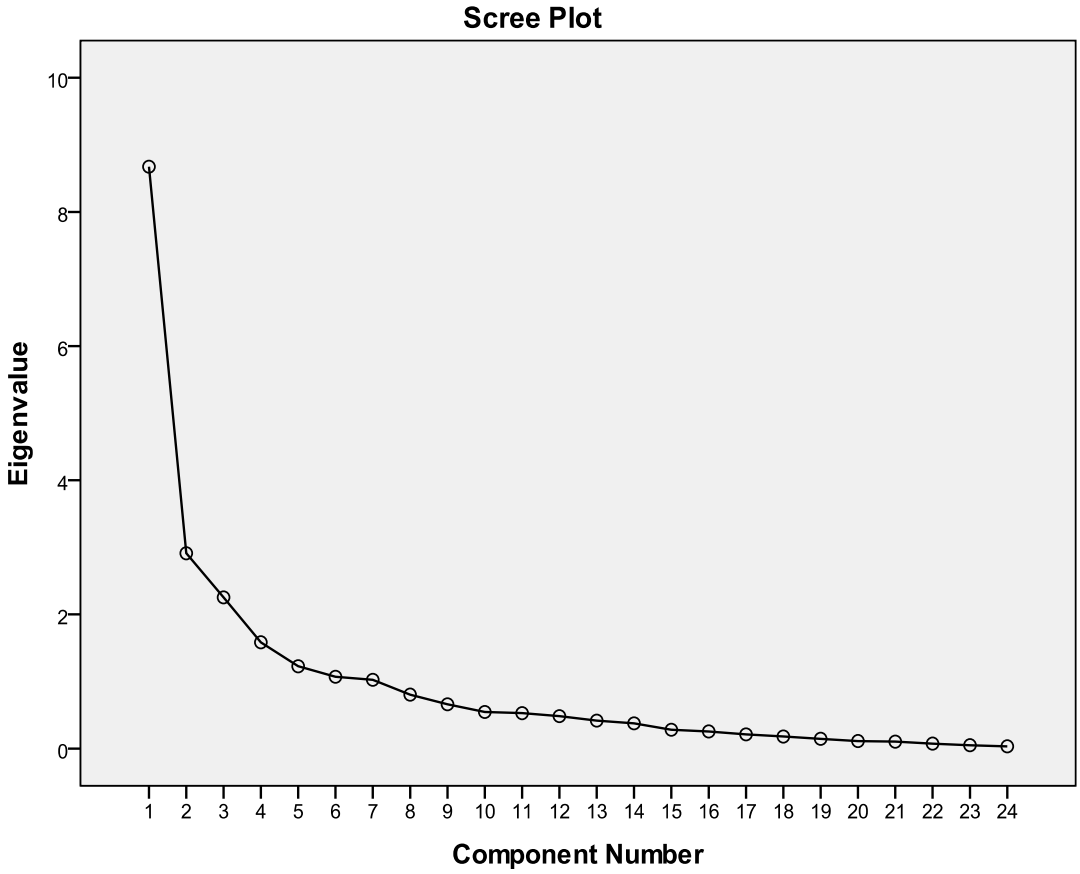

Figure 7.11: The scree plot showing extracted factors under exogenous risk factors.

Similarly, PCA was also undertaken with the endogenous risk factors. The 44 endogenous risk factors collated from the literature were split into two i.e. 24 and 20 for adequacy of the sample for FA. Table 7.23 has shown the initial Eigenvalues of the five extracted factors from the first 24 endogenous risk factors. It is obvious from the table that the first component has explained the largest amount of variance with a total of 9.482 which has represented 43.101% of the total variance. In addition, those five components extracted have explained a total variance of 72.908% which could be said to be significant. Moreover, the scree plot result has equally confirmed the number of extracted factors to be five; as the plot has changed direction on the 5th component as revealed in Figure 7.12.

Furthermore, Table 7.24 has presented the total variance explained by the 4 factors/components extracted from the remainder of the 20 endogenous risk factors. It is obvious that the 1st component has explained 41.473% total variance; while the last component has explained 6.432% total variance. A cursory look at the communalities between the factors has revealed that all variables had a communality equal or higher than 0.50 which has been deemed the acceptable criterion for factor extraction.

Table 7.23: Total variance explained by the 5 extracted factors in endogenous risk factors.

	Initial Eigenvalues.			Extraction Sums of Squared Loadings.		
Component	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
1.	9.482	43.101	43.101	9.482	43.101	43.101
2.	2.286	10.391	53.491	2.286	10.391	53.491
3.	1.933	8.785	62.276	1.933	8.785	62.276
4.	1.218	5.535	67.812	1.218	5.535	67.812
5.	1.121	5.096	72.908	1.121	5.096	72.908

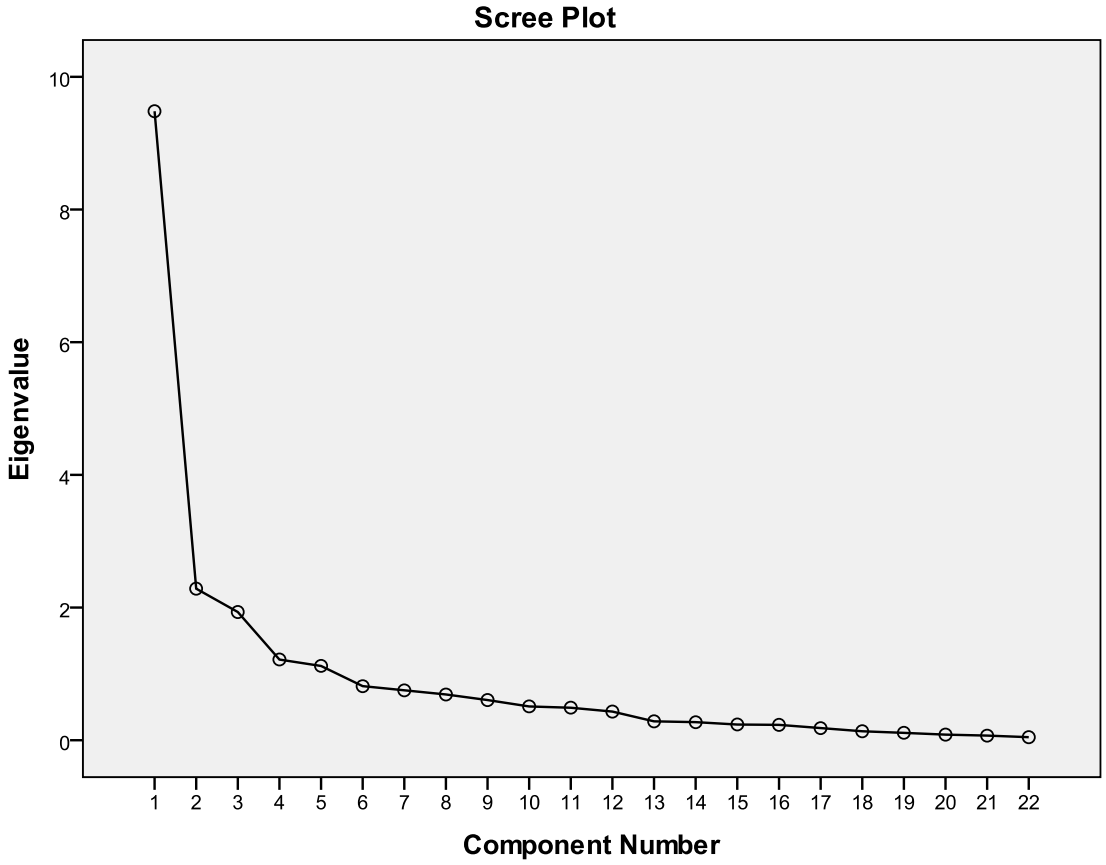

Figure 7.12: The scree plot showing extracted factors under endogenous risk factors.

Table 7.24: Total variance explained by 4 extracted factors in endogenous risk factors.

	Initial Eigenvalues.			Extraction Sums of Squared Loadings.		
Component	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
1.	7.465	41.473	41.473	7.465	41.473	41.473
2.	2.440	13.555	55.028	2.440	13.555	55.028
3.	2.066	11.477	66.505	2.066	11.477	66.505
4.	1.158	6.432	72.937	1.158	6.432	72.937

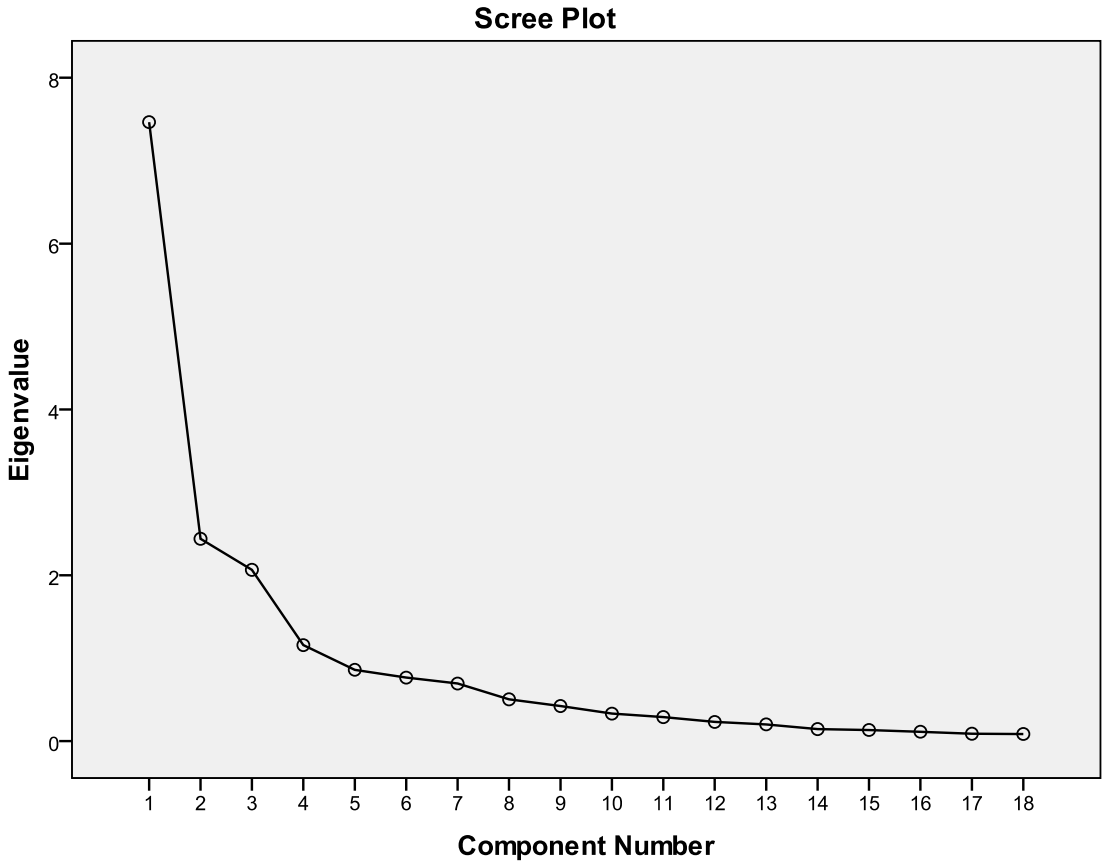

Figure 7.13: The scree plot showing extracted factors under endogenous risk factors.

7.11. 3: Factor rotation and interpretation

As suggested by Pallant (2010), the next step in FA after factor extraction is factor rotation and interpretation. It has been argued by researchers who have used or written about FA, that in this form or analysis an unrotated PCA factor matrix only indicates the relationship between individual factors and the variables; and that sometimes it can be very difficult to interpret the pattern (Akintoye, 2000 and Pallant, 2010). In order to

easily interpret the results generated from the second step, the factors were subsequently rotated. It must be mentioned that this rotation does not change the underlying solution but presents the pattern of loadings in a manner which are easier to interpret. To facilitate this rotation therefore, out of the two rotation methods identified in the literature, i.e. the orthogonal method and the oblique or correlated factor method; the orthogonal method was employed for the rotation. This decision was informed by the assertion made by Tabachnick and Fidell (2007) that orthogonal rotation results in solutions that are easier to interpret and report. SPSS provided different rotational techniques under the two rotation methods. For example, under the orthogonal method we had varimax, quartimax and equamax; whilst under the oblique method we had direct oblimin and promax. The most commonly used orthogonal approach is the varimax method (Pallant, 2010). Therefore, the study employed the varimax method which attempted to minimise the number of variables that had high loadings on each factor. The assumption here is that the underlying constructs are independent i.e. not correlated. Moreover, Thurstone (1947) believed that researchers using FA, especially PCA, were anticipating what was termed a "simple structure". Accordingly a simple structure would involve each of the variables loading strongly on only one component; and each component would be represented by a number of strongly loading variables. Thus varimax rotation was performed on the extracted factors from both the exogenous and endogenous risk factors. The rotation helped to redistribute the explained variance between the extracted factors for clarity in their interpretation without changing the total explained variance. This was facilitated through the PAWS 18 statistic software by making large variable loadings larger, and small variable loadings smaller; with a view to constructing a simple structure.

The loading of each factor under the three classifications has been shown in Appendix P, Q and R. To arrive at these results, i.e. a simple structure solution as shown in these appendixes; varimax rotation were performed several times on the three groups to eliminate complex variables i.e. variables that had high loading on more than one of the factors. Tables 7.25 have shown the factor groupings based on the varimax rotation method performed on the 24 exogenous risk factors. The rotation was repeated several times to eliminate complex variables such as: (i) Force majeure; (ii) Import/export restriction; (iii) Corruption and lack of respect for law; (iv) Legislation inconsistencies; (v) Unstable government; (vi) Poor financial market; and (vii) Change in tax regulation that loaded highly on more than one of the factors.

Table 7.25: Rotated factor matrix showing the loading of each factor under the extracted components in exogenous risk factors.

Variables	**Component 1.**	**Component 2.**	**Component 3.**	**Component 4.**	**Component 5.**	**Component 6.**	**Component 7.**
Weather.	.8282						
Geotechnical conditions.	.8000						
Environment of the project.	.7928						
Industrial regulation change.	.7111						
Cultural differences between main stakeholders.	.6458						
Rate of return restrictions.	.5968						
Exchange rate fluctuation.		.8739					
Influential economic event (boom/recession).		.8518					
Interest rate volatility.		.7996					
Inflation rate volatility.		.7751					
Non-involvement of host-community.			.8832				
Public opposition to projects.			.8214				
Inconsistencies in government policies.				.8321			
Strong political opposition/hostility.				.6868			
Lack of tradition of private provision of public services.					.8105		

Poor public decision making process.						.9005	
Possible expropriation/ nationalisation of assets.							.9330
Eigenvalue.	8.674	2.911	2.253	1.584	1.226	1.071	1.025
Percentage of variance explained.	36.141	12.131	9.389	6.600	5.110	4.461	4.273

From Table 7.25, it is obvious that each of the variables has weighed heavily on only one of the factors; and the loading on each factor has exceeded 0.5. In addition, whereas six variables/factors were grouped under the first component, component 2 had four factors under it which explained 12.131% of the total variance. Component 7 had only one factor under it with an Eigenvalue of 1.025 which explained 4.273% of the total variance. Similarly, Tables 7.26 have shown the factor groupings based on the varimax rotation method that was performed on the 24 endogenous risk factors. The rotation was repeated several times to eliminate complex variables namely: (i) Construction time overrun; (ii) Availability of appropriate labour/material; and (iii) Land acquisition/site availability that loaded highly on more than one factor. It was evident that 7 factors were grouped under the 1st component; whilst 3 factors each were grouped under the 4th and 5th components respectively.

Appendix R has shown the loading of each factor under the remaining 20 endogenous risk factors. In order to achieve a simple structure, varimax rotation was performed several times to eliminate complex variables. Five (5) complex variables were thereafter eliminated from the endogenous risk factors. From the remaining factors, 4 principal components were extracted. Table 7.27 has shown the factor groupings based on the varimax rotation method that was performed on the 15 endogenous risk factors. The eliminated variables are as follows: (i) Competitive market (a product with a close substitute); (ii) Inadequate distribution of responsibilities and risks; (iii) Staff crises; (iv) Operational revenue below projection; and (v) Poor quality of workmanship. Six (6) out of 15 risk factors were grouped under the 1st component followed by 5 under the 2nd component and components 3 and 4 had 3 and 1 variable each respectively.

It is obvious from Tables 7.26 and 7.27 that a total of 9 components were extracted from the 44 endogenous risk factors gathered from the literature. These coupled with the 7 extracted from the 24 exogenous risks made a total of 16 components. The variable under each component has been discussed in turn. From the FA results, it has been evident that 17 out of 24 exogenous risk factors were extracted as the most significant risk factors that affected PPP market projects in Nigeria. Whilst out of the 44 endogenous risk factors 36 were extracted as being most significant. Thus it can be concluded that a total of 53risk factors could impact on the success of the PPP market project in Nigeria (refer to Tables 7.25 -7.27).

Table 7.26: Rotated factor matrix showing the loading of factor under the extracted components in endogenous risk factors.

Variables.	**Component 1.**	**Component 2.**	**Component 3.**	**Component 4.**	**Component 5.**
Liquidity.	.8040				
Lack of government guarantees.	.7485				
High bidding costs.	.6877				
Depository.	.6726				
Inability to service debt.	.6430				
High finance cost.	.5736				
Bankruptcy of concessionaire.	.5679				
Competition risk.		.8808			
Prolonged negotiation period prior to initiation.		.6947			
Level of demand for the project.		.6898			
Manpower problem associated with trade unions.		.5722			
Unproven engineering techniques.			.8262		
Design deficiency.			.7844		
Late design changes.			.6024		
Fault in tender specification.			.5523		
Residual value (after concession period).				.8349	
Financial attraction of project to investors.				.6777	
Delay in project approvals and permits.				.6238	
Construction cost overrun.					.7703
Availability of finance.					.7614
Lack of creditworthiness.					.6893
Eigenvalue.	9.482	2.286	1.933	1.218	1.121
Percentage of variance explained.	43.101	10.391	8.785	5.535	5.096

Table 7.27: Rotated factor matrix showing the loading of factor under the extracted components in endogenous risk factors.

Variables	**Component 1.**	**Component 2.**	**Component 3.**	**Component 4.**
Low operating productivity.	.8779			
Life of facility shorter than that anticipated.	.8419			
Operation cost overrun.	.8286			
Organisation and coordination risk.	.7411			
Inadequate experience in PPP.	.6999			
Lack of commitment from public/private partner.	.6253			
Excessive contract variation.		.8421		
Risk regarding pricing of product/service.		.8158		
Third party tort liability.		.7497		
Insolvency/default of subcontractors and suppliers.		.7437		
Maintenance more frequent than expected.		.6813		
Different working methods/know-how between partners.			.9068	
Inadequate distribution of authority between partners.			.8369	
Counter party's creditworthiness.			.6496	
Maintenance cost higher than expected.				.8783
Eigenvalue.	7.465	2.440	2.066	1.158
Percentage of variance explained.	41.473	13.555	11.477	6.432

The components and associated variables/factors as shown in Tables 7.25, 7.26 and 7.27 are readily interpretable. This result into the production of Table 7.28 and 7.29 has provided the summary of the extracted factors from both the exogenous and endogenous risk factors and their nomenclature that was adopted for inclusion in the proposed Risk Management framework developed in this study. From Table 7.28 principal component 1 (PC1) has represented the environmental and cultural risk; PC2 the economic risk; PC3 public opposition; PC4 political risk; PC5 lack of tradition of private provision of public services, PC6 the bureaucracy risk, and PC7 for the nationalisation of assets.
Likewise, in Table 7.29, PC1 has represented insolvency of partners; PC2 competition risk; PC3 faulty contract documentation; PC4 return on investment; PC5 financial risk; PC6 wrong estimation due to inexperience of the PPP model; PC7 the multi-party risk; PC8 the organisational risk and immature juristic system; and PC9 the maintenance risk. All of these components have subsequently been discussed in turn.

Table 7.28: Summary of factor analysis groupings under exogenous risk factors

	Component 1.	**Component 2.**	**Component 3.**	**Component 4.**	**Component 5.**	**Component 6.**	**Component 7.**
Influential factors.	**Environmental Cultural risks.**	**Macroeconomic policies.**	**Public opposition.**	**Political risk.**	**Lack of PPP tradition.**	**Bureaucracy risk.**	**Nationalisation of assets.**
1.	Weather condition.	Exchange rate fluctuation.	Non-involvement of host community.	In-consistencies in government policies.	Lack of tradition of private provision of public services.	Poor public decision making process.	Possible expropriation/nationalisation of assets.
2**.**	Geotechnical condition of the construction site.	Influential economic event (boom/recession).	Public opposition to projects.	Strong political opposition/hostility.			
3.	Environment of the project.	Interest rate volatility.					
4.	Industrial regulation change.	Inflation rate volatility.					
6.	Rate of return restrictions.						

Table 7.29: Summary of factor analysis groupings under endogenous risk factors

	Component 1.	**Component 2.**	**Component 3.**	**Component 4.**	**Component 5.**	**Component 6.**	**Component 7.**	**Component 8.**	**Component 9.**
Influencing factors.	**Insolvency of partners.**	**Competition risk.**	**Faulty documentation.**	**Return on investment.**	**Financial risk.**	**Wrong estimation due to inexperience of PPP.**	**Multi-party risk.**	**Organisational risk and immature juristic system.**	**Maintenance risk.**
1.	Liquidity risk.	Competition risk.	Unproven engineering techniques.	Residual value after concession period.	Construction cost overrun.	Low operating productivity.	Excessive contract variation.	Different working methods/know-how between partners.	Maintenance cost higher than expected.
2.	Lack of government guarantees.	Prolonged negotiation period prior to initiation.	Design deficiency.	Financial attraction of project to investors.	Availability of finance.	Life of facility shorter than anticipated.	Risk regarding pricing of product/service.	Inadequate distribution of authority between partners.	
3.	High bidding costs.	Level of demand for the project.	Late design change.	Delay in project approvals and permits.	Lack of creditworthiness.	Operation cost overrun.	Third party tort/liability.	Counter party's creditworthiness.	

4.	Depository risk.	Manpower problem associated with trade unions.	Fault in tender specification.			Organisation and coordination risk.	Insolvency/default of subcontractors and supplier.		
5.	Inability to service debt.					Inadequate experience in PPP.	Maintenance more frequent than expected.		
6.	High finance cost.					Lack of commitment from public/private partner.			
7.	Bankruptcy of concessionaire.								

7.11.4: Discussion of factor analysis results

7.11.4.1 Environmental and cultural risk

Environmental and cultural risks were made up of weather condition; geotechnical condition of the site; environment of the project; industrial regulation change and cultural differences between main stakeholders. These risk factors have been pre-classified under exogenous risk factors i.e. risk factors external to the particular PPP market project under consideration. This classification was adopted from Ibrahim *et al.*., (2006). It is noteworthy that these factors are loaded together under the same component. The environment in which a project is being carried out will definitely affect the success of the project. For instance, in harsh weather the productivity of the workforce will definitely be impaired. Moreover, inclement weather conditions will reduce the working hours and may impact on the project delivery time. Similarly, the geotechnical condition of the site can have an impact on the success of the project. Thus the sense that the nature of the site condition i.e. whether stable or unstable ground will affect the type of design to be used and the complexity of the design; which in turn will have a multiplier effect on the cost of the project. Gidado and Millar (1992) submitted that project complexity affected contract duration and consequently affected the overall construction cost.

With regards to cultural differences between the main stakeholders (i.e. the private and the public sector), it is predictable and true that the private sector and public sector have different and contrasting cultures to one another. Culture is seen as embracing knowledge, beliefs, arts, morals, law, customs and any other capabilities and habits acquired by man as a member of society; as well as collectively shared values and norms found within business for co-existence and the ways of doing things (Pheng and Leong, 2000; Mead, 1998 and Lundy and Cowling, 1996). Organisational culture in turn, according to Barthorpe *et al..,* (2000), can be reflected in the way people within an organisation perform tasks, set objectives and administer the necessary resources to achieve objectives. For instance as the private sector can be viewed as more economically minded than their public counterpart; the private sector has a tendency to be more profit oriented which in turn can affect their outlook with regards to issues regarding performance and productivity. Wahab, (2006) lamented about the deplorable condition of public infrastructure in Nigeria and asserted that the attitudes of public officers to work and use of public infrastructure were some of the main causes of the decay in the country's infrastructure; whereas the quest to generate greater profit and to

remain in business explained the effectiveness and efficiency in the way the private sector conducted their operations.

7.11.4.2 Macroeconomic policies

Macroeconomic policy factor grouping comprises exchange rate fluctuation; influential economic boom or recession; interest rate volatility and inflation rate volatility. Exchange rate fluctuation and interest rate volatility would normally affect other factors of production such as materials, capital and machineries. When the interest rate or exchange rate is higher than anticipated, this may result in higher debt servicing costs for the private sector who source these factors of production; and can definitely have a serious impact on the success of PPP projects. In short, cost variation due to inflation or other macro-economic factors may lead to the private sector being unable to recover redundant operating costs. Thus in order for the private sector to achieve their desired profit margin, they may want to increase the consumer price which will ultimately affect the satisfaction of the end users if the price is considered to be too high. Moreover, in case of an influential economic event such as a boom or recession, it is true that this will either have a positive or negative impact on the project. If there is a recession, then the cash-flow associated with private sector financing of the project may also be affected.

7.11.4.3 Public opposition.

Two risk factors were grouped under this component namely: non-involvement of host community and public opposition to projects. It is predictable that these factors have been grouped together with a high Eigenvalue of 0.8832 and 0.8214 respectively. It can be common to see the host community demanding adequate participation of local people in any community based developmental project. Since PPP projects do not exist in a vacuum, they need people to work on them; and therefore it can be natural to see local people revolting if they are not employed within local projects especially when such a labour force would be available. The opposition could be in the form of a demonstration which subsequently would provide the private company with a bad reputation. It could also potentially lead to the disruption of work on site. This would definitely have a detrimental effect on the success of the overall project. This finding also corroborates the findings of Awodele *et al..,* (2007) who found that one of the main problems experienced by contractors working in the oil producing region of Nigeria was community opposition. Accordingly this was is in form of outright disruption of work by militants on site who demanded the involvement of the local people. It is pertinent to note that the Nigerian government has enacted a law which employs private partners to adequately involve the local community in their projects.

7.11.4.4 Political risk

Inconsistencies in government policies and strong political opposition/hostility are the two factors under this component. This grouping can be said to be true in that in Nigeria, some political office holders, such as local government chairmen and State governors make certain policies that are not always in agreement with Federal government policies primarily because they are not in the same political party; or because of short-term goals or personal interests. At times these policies can lead to a lack of continuity in government policies. In this circumstance, PPP projects that are based on the unreasonable or unrealistic promises of either local government or officials may be liquidated when there are changes in the laws and policies or changes in key officials associated with the government. This can subsequently prevent investors from being able to operate successfully within the PPP projects and thereby not achieve the expected return on investment that was originally anticipated. Furthermore, it can be common within Nigeria to see a government official or political office holder offering some reasonable and realistic policies. However because such an official may not have belonged to the ruling party, or has been from another party, the whole community may have a tendency to oppose such policies primarily because they have not wanted them to be fruitful. They may even carry out public demonstrations to disrupt PPP projects which fall under these types of policies. In an atmosphere that is full of violence, nothing productive can be achieved and thus the PPP project can fail to deliver the expected benefits to the populace.

7.11.4.5 Lack of tradition of private provision of public services

The risk of lack of tradition of private provision of public services occurs as a lone component under the exogenous risk factors. This risk factor can be explained as a situation in which the host community views the provision of services as the sole responsibility of the public, and thus they are disturbed when such infrastructure is being procured using the PPP model. For instance in Nigeria, the provision of market facilities; water supply; electricity supply; roads, health care facilities and schools etc, are seen as solely the responsibility of the public sector. However when the government begins to embrace the use of PPPs, Nigerians can often view this as odd believing that their government has simply been shying away from their responsibilities providing the private sector with more opportunities to exploit the citizens of the country. This type of perception can surely affect the position the community taking on projects based on the PPP arrangement as there has been no historical tradition with regards to this.

7.11.4.6 Bureaucratic risk

This component is related to the poor public decision making process. Although this component has a single factor associated with it, it is however very important for the success of any PPP project. In Nigeria there are a significant number of bureaucracies involved in reaching governmental decisions and this would appear to affect the number of projects that are executed or the speed of a project. This assertion has concurred with the findings of the World Economic Forum report that identified inefficient government bureaucracy as a significant problematic factor for facilitating business in Nigeria (WEF, 2010). Furthermore, because of such inefficiency, on occasion governments can make the wrong decisions for example, governments providing too many guarantees to certain investors for the development of particular PPP projects; or not being able to weigh up the risks to be transferred to the private sector before accepting the price offered by the private sector. Thus making the bid too high for the government to fulfil and ultimately resulting in a default in the payments. Such poor decision making can subsequently lead to complaints from the general public; and even result in the termination of such a contract.

7.11.4.7 Nationalisation of assets

This is the last component under the external risk factors which was deemed as being significant to the success or failure of PPP projects. Nationalisation or expropriation of assets is a situation whereby the government takes over the facility run previously by the private company without the provision of reasonable compensation. It is predictable that this risk factor should be a significant risk that will ultimately impact on the success of any PPP project. In addition, it is not surprising to view this component as a single factor component. It is obvious that due to political reasons, or lack of tradition of private provision of public services, that the government may take over the facility run by the private company. However when the government does not provide reasonable compensation to the private sector this can subsequently lead to a disastrous outcome such as litigation. In turn litigation can be time consuming, expensive and within a prolonged court hearing pertaining to the project, the project can be abandoned and people may not derive any benefit.

7.11.4.8 Insolvency of partners

This is the first component under the endogenous risk factors, i.e. those risk factors that are internal to a particular PPP project. This component has seven variables under it as has been provided in Table 7.29. They are: (i) Liquidity; (ii) Lack of government guarantees; (iii) High bidding costs; (iv) Depository; (v) Inability to service debt; (vi)

High finance cost; and (vii) Bankruptcy of concessionaire. Since the shortage of government funding is one of the major driving forces for the public sector to promote PPP implementation, it is then understandable that liquidity i.e. the amount of money available to spend on the projects is considered to be an important factor that can affect the success of a PPP project. Ndekugri and Russell (2005) asserted that the term 'insolvency' was an omnibus word for various situations in which a company was unable to meet its debts. This may pertain to private or public partners. The implication of this would be that there would be a shortage of funds to meet the debts of the organisation. If there is a shortage of money from the private partner financing a PPP project, the project would not progress as expected, and it would therefore affect the speed of construction. In addition the quality of the project could be compromised and this could lead to the use of inappropriate technology and a potential increase in the accident rate on site. In a similar manner, bankruptcy of the concessionaire would surely affect the PPP project if the private partner supposed to finance the project became bankrupt. Likewise, if the concessionaire, due to the poor rate of return on the project, could not service its debts, then their inability to service this debt would surely have a detrimental effect on the project and affect its creditworthiness of the private partner. This could ultimately affect future access to loans; and could even result in the lender confiscating the entire project which in most cases would be used as collateral for the loan.

Moreover, in the case of lack of government guarantees, it is important to understand what guarantees actually are. Ndekugri (1999) whilst attempting to advise construction owners and professionals on the issues of performance bonds and guarantees explained that there had been considerable litigation which had arisen from bonds and guarantees issued in support of obligations under construction and engineering contracts. The reason he advanced for this was a lack of sufficient understanding of the exact nature of these instruments and the use of medieval language in their wording; worsened further by a miscellany of confused terminology used virtually interchangeably (Ndekugri, 1999).

Quoting from Halsbury's laws of England, Ndekugri defined a guarantee as "*an accessory contract by which the promisor (the guarantor) undertakes to be answerable to the promisee (the creditor) for the debt, default, or miscarriage of another person (the debtor), whose primary liability must exist or be contemplated"*.

In a PPP arrangement, it is considered the norm to view the host government that engages with a private investor to design, build and operate public services which guarantee a minimum purchase of project output; or indirectly help the private sector through adjusting the tariff with demand. In the event of poor demand for the final service, the government would be prepared to pay the private investor up to the guaranteed level. All of these ideas help to provide assurance of commitment to the private partner. However a lack of government guarantee in this form can surely affect the success of the project, in that the private sector may see themselves as taking or bearing too much risk. Subsequently they would have to factor in this heavy risk into the tariff or price to the consumer, which would definitely affect the satisfaction of the end users and ultimately affect the project.

7.11.4.9 Competition risk

Competition factor grouping is made up of competition risk, prolonged negotiation period prior to initiation, level of demand for the project and the manpower problem associated with trade unions. Competition in this respect refers to a situation whereby the government does not offer the exclusive right to the private sector but allows others to build another competitive project side by side with the PPP project. In this case competitive risk would occur when another shopping centre or market was built close to the PPP market. It is interesting to note that the level of demand was grouped with this risk factor. It is obvious that when such a situation occurs, the level of demand will fall because the sponsor has not envisaged such from the onset. The level of demand could also change due to changes in certain social and economic factors. For instance if there was an economic meltdown and people began to lose their jobs, they would not be able to go shopping as they would only do so if they were gainfully employed. These scenarios would surely make the level of demand fall and would invariably affect the concession period. Understandably, a prolonged negotiation period prior to initiation of a PPP project may lead to the development of another competing project within the same locality which would affect the take-off of such a PPP project. In addition, when there is a problem of manpower due to trade unions setting unrealistic and unreasonable demand on the private sector, since the project would require people to work on it, then this would also have a serious impact on the project.

7.11.4.10 Faulty documentation

This factor grouping comprises issues such as unproven engineering techniques; design deficiency; late design changes, and fault in tender specification. These factors loaded high with (*sig.* = 0.83, 0.78, 0.60 and 0.55) respectively. It is obvious that when there

are shortcomings in project design, a fault in tender specification and late design changes to the project will subsequently experience problems. For instance, if there was an omission or an error in the original design and the contract drawing formed part of the tender documents, this would already imply faulty documentation. If the design error was not corrected until the project has reached an advanced stage, such late changes would be more expensive and could potentially affect the stability of the project especially if the error was related to the foundation of the structure. The use of unproven engineering techniques could also have a serious impact on the project. For instance if a worker used equipment which they were unfamiliar with, it could potentially affect their productivity as well as expose them to potential accidents all of which could affect the successful delivery of the given PPP project.

7.11.4.11 Return on Investment

The residual value of the project after the concession period arguably could affect the success of a PPP project because the residual value can depend on a number of variables, amongst which is the return on investment. If the expected return on investment is considered too high, in order not to put too high a price on the end users, the concession period could be elongated. This would mean that the residual value of the project could be low because the project life cycle has been outspent. Thus, if we wanted the residual value to be reasonable; then the concession period need not be kept reasonable as well to avoid exceeding the useful life span of the particular project.

Similarly, delays in project approvals and permits would impact on the success of the PPP projects. Thus if approvals on vital aspects of the project were not given on time and valuable time was wasted waiting to determine the direction in which to go; in this situation inflation could cut up the project and other time related issues could also occur which would affect the success of the project.

The financial attraction of the project to investors is another variable under this component. A PPP project could be said to be attractive if the returns on the project outweigh the capital outlay or the total investment. PPP projects would definitely be affected if the proposed project did not seem to yield a good return to the investor. Thus it could potentially make the project unattractive to an investor as each investor is looking for a way to turn around their capital in order to generate more profit and stay in business. Poor financial attraction of projects to investors can mean that excellent investors with brilliant ideas may not be interested, which in turn could encourage less

qualified investors who may not be able to offer their best. Just like the popular adage in Yoruba that says "*Bi owo ba timo ni Oogun yio mo*" meaning that the medicine/treatment you receive from a doctor/physician will depend on how much you pay or are prepared to pay. Cut your coat according to yours size (material?)

7.11.4.12 Financial risk

This factor grouping comprises construction cost overrun, availability of finance, and lack of credit worthiness. The success of any PPP arguably will depend on the availability of finance. As mentioned earlier, infrastructure development requires a huge capital outlay, and even the private sector need to adequately plan their cash flow. In a situation where the planned construction cost overrun, it can surely affect the cash flow forecast and can definitely impact on the success of the project. Moreover, if an investor is not deemed credit worthy, then the securing of the loan/finance for the lender can be difficult; and if finance is not available then absolutely nothing can be achieved on site.

7.11.4.13 Wrong estimation due to inexperience in the PPP arrangement

This factor grouping is another significant component that can impact on any PPP project. The factor grouping includes: Low operating productivity; life of facility shorter than that anticipated; operation cost overrun; organisation and coordination risk; inadequate experience in PPP and lack of commitment from public/private partner. Experience is often cited as being the best teacher. The problem of false estimations due to inadequate experiences in PPP arrangements can occur in the early stage of any PPP project, due to lack of prior experience in handling similar type of project; particularly when both parties fail to understand the requirements and responsibilities involved in the project. This becomes more complex when a private sector partner does not know the views of the public partners; miscommunication of requirements, acceptance criteria, and project objectives can result in gross estimation errors, conflicting and continuous requirement changes, and inaccurate requirement analysis. This often result in a gross miscalculation of the cost of the project (i.e. the whole life cycle cost of the project), which invariably leads to problems such as low operating productivity, an overrun of operational costs, the life of the facility being shorter than anticipated, and can reduce the commitment of the partners. The same issue was reiterated by Baccarini (1996) and Smite (2006). Researchers in the software industry even asserted that project managers fail to make correct estimations in the initial stages of software development and sometimes distort facts or become too optimistic, thus creating gross estimation errors (Keil *et al.*., 2004; Snow *et al.*., 2007). From the above, it is apparent that all the risk factors under this grouping have one commonality; inadequate experience with PPP

leading to under or otherwise inaccurate estimation error, which in turn affects operating productivity, the life span of the project, operating costs etc.

7.11.4.14 Multi-party risk

Multi-party risk is the name given to the seventh component under endogenous risk factors. The variables falling within this risk component are shown in table 7.29. Due to the multiple parties involved in PPP projects, with varying needs and requirements, it is common to see different changes leading to variable results. When this is not controlled, i.e. when there is no effective change management or control system, then the project's success can be jeopardised. In addition, it is necessary to control all elements of the process to ensure success; for example, if subcontractors and suppliers become insolvent, this may affect the entire project, as many activities within the project might be affected by a single subcontractor or supplier. On the other hand, if an unreliable supplier is chosen for the work, there can be many additional problems, such as poor and undependable materials, late delivery of critical materials/components, and so forth. This will have a disastrous effect on the project and prevents it from meeting the customers or client's specifications. Moreover, since partners are considered agents of the partnership, when one of the parties to the PPP arrangement wrongfully does something, or forgets to do something, which then leads to a problem, because of the partnership agreement between the two, i.e. private and public, both parties are liable and may have to suffer the loss together, this is the case under third party tort liability, which in law is referred to as a vicarious liability, a term that is also used when a business is liable for the acts of an employee acting within the scope of his or her employment. It is obvious that many risks occur due to the multi-party nature of the PPP arrangement, and that good management is therefore critical.

7.11.4.15 Organisational risk

As is clear from table 7.29, the eighth component comprises three factors, all of which are related to issue of organisational structure. This component deals with risks related to the complex organisational structure in the PPP project. As mentioned earlier, there are many parties involved in PPP projects, viz; public, private, consultants, contractors, suppliers, facilities managers, lenders etc. This multi party has different working methods and their expertise differs from one to the other. These variances in working methods, and know-how regarding PPP models, usually impacts on the success of a PPP project. Moreover, it is easy for some people to get together easily with others while it is difficult for others. This may then lead to a situation where a selected few work and relate closely to others on a PPP project, in contrast to other situations which may result

in a straining of the relationship between parties. In addition, when there is inadequate distribution of authority between partners, people tend not to know who is responsible for what and who is doing what at a particular time, thus leading to confusion, duplication of effort and overall reduced productivity. This is the situation that Gordon (1994) and Chua *et al.*., (1999) tried to correct when they argued that there should be a clear and unambiguous statement of project objectives regarding the obligations and rights of the contracting parties. They argued further that this could be achieved through proper selection of appropriate contractual arrangements, which help to provide adequate clarity of plans and technical specifications, a formal dispute resolution process, and motivation and incentives to contracting parties.

7.11.4.16 Maintenance Risk.

Maintenance risk is the name given to the last but not the least risky component, under the umbrella of the endogenous risk factor. This component comprises a single factor, thus it derives its name from this single factor, as shown in table 7.29. It is understandable that when maintenance costs are higher than expected there will be a disastrous impact on the project's success; reducing the profit margin of the investor. It might then lead to the investor trying to increase the price to the consumer or reducing the quality of services provided. Huang and Trauth (2007); and Jannson (2007) suggested the use of effective configuration control and documentation in reducing the maintenance problems in the software industry. It is evident therefore, that this is another significant risk factor which needs to be managed adequately to guarantee the success of PPP projects.

7.12 Summary of Chapter

In this chapter, the results and discussion of findings from the quantitative strand of the study have been presented. The presentation was tailored in line with the objectives and the structure of the research instrument used (i.e. questionnaires). In the first section of the chapter, the analysis and findings from the demographical information collected about the respondents revealed that the respondents have adequate knowledge and experience with which to provide useful responses to issues raised in the research instrument (i.e. risk in PPP market projects). Moreover, the following sections discussed the likelihood of the occurrence and consequences' of the occurrence of the 68 risk factors identified; as grouped into two broad categories viz, exogenous and endogenous risk factors. In addition, it was reported in this chapter, that 15 out of the 68 risk factors were found to be critical to PPP market projects with the rest being somewhat critical.

Since risks were to be allocated to the party best able to manage it, in this chapter, it was further revealed that, respondents in this study preferred to allocate 33 of these risks factors to the private partners while public partners should oversee only 9 out of the 68 risk factors. The remaining 26, in the opinion of the respondents, are to be shared by both parties. Possible mitigation measures were identified and assessed in the chapter. It was apparent that virtually all the 37 mitigation measures identified in the literature were rated as being effective by the respondents. 28 precisely were rated effective while the respondent rated 9 as being somewhat effective.

The study further discussed the findings from the questionnaires administered to the end users of PPP markets, i.e. Shoppers and Traders. The chapter has provided an insight into shoppers' and Traders' perceptions of the PPP markets in the south western zone of Nigeria. It was reported in the chapter that there were appreciable improvement in the new market developed using a PPP arrangement as compared to that developed based on government funding alone. Nevertheless, in terms of the satisfaction of the end users of these facilities, the traders and shoppers at the market expressed their satisfaction over some dimensions, while they equally expressed their dissatisfaction regarding other dimensions. Overall, both shoppers and traders in the PPP market were dissatisfied with market facilities. Reasons gathered from these groups of respondents' range from lack of adequate parking spaces around the market, the high cost of the facility and the price of goods in the market. The traders have equally argued that the design of the marketplace, though very modern, does not take into account the need in term of space, orientation and the tastes of the end users. Thus they are dissatisfied with the unfriendliness of the design. These dimensions were noted as requiring improvement in future development.

Moreover, as revealed in the extant literature, there is a general view held within the industry as a whole that an adequate management of risk is crucial to the success of any construction project, be it a government funded or a privately funded project, or an economic or social project. As a result, an analysis of risk factors that can have disastrous consequences in cases of their occurrence is imperative. The probability of such occurrences, and any possible consequences in case of occurrence, has been assessed using mean ranking based on the perceptions of the respondents. Further, the Factor analysis technique was employed to capture any multivariate relationships between the risk factors. The appropriateness of this analytical technique was

established in this chapter using the Kaiser-Meyer-Olkin (KMO) measure of sampling accuracy, anti-image correlation, measure of sampling adequacy (MSA) and the Barlett test of sphericity. In summarising these it was revealed in the chapter that the 68 risk factors could be grouped into 16 components with seven (7) emanating from exogenous risk, i.e. risk external to the project, and nine (9) arising from endogenous risk, i.e. risk internal to the project. It is recognised therefore in this chapter that these risk groupings represent the elements that need to be considered in any PPP projects, especially market projects in Nigeria. These risk groupings are to be taken a step further by incorporating them into the risk management framework for the PPP market projects to be proposed and an output from this study (see Chapter 9).

CHAPTER 8

DATA PRESENTATION, ANALYSIS AND DISCUSSION (2)

"In order to give the details of their experience a beginning, middle, and end, people must reflect on their experience. It is this process of selecting constitutive details of experience, reflecting on them, giving them order, and thereby making sense of them that makes telling stories a meaning-making experience."
— I.E. Seidman (2006) (Interviewing as Qualitative Research)

8.1 Introduction

As discussed earlier, in the previous chapter, the data presentation, analysis and discussion for the study have been structured into two parts in line with the convergent/triangulated mixed methods research design adopted. The quantitative strand of the study was reported in the previous chapter, i.e. chapter 7. This chapter presents analysis and discussion of the findings taken from the qualitative strand of the study. It also presents the discussion, regarding possible areas of agreement and difference following the merging of the findings from the quantitative and qualitative strands. The chapter summarises the results from these two research strands and presents them in a form that is ready for inclusion in the risk management framework.

8.2 Analysis and Discussion of Qualitative strand of the study

This involves the analysis of data collected from the three case studies, i.e. the three PPP markets that were selected for the study within the south-western zone of the country viz: (i) the reconstruction of Erekesan Market in Akure, (ii) the redevelopment of Oluwole Urban Market in Lagos and (iii) the Ikeja Cantonment Ultra Modern Market Complex in Lagos. Data was collected using semi-structured interviews, personal observations and a review of documentary evidence relating to the case studies selected. The presentation has been structured in line with the replication approach involved in the multiple-case study as illustrated in figure 6.5 (see the methodology chapter). Before the presentation and discussion of findings from the qualitative strand of the study, it is important to first describe the systematic approach followed in the collection and analysis of data under qualitative strand of the research.

8.2.1 Qualitative data collection

As earlier mentioned, qualitative data were collected from three PPP markets within south-western zone of Nigeria using semi-structured interviews; personal observation and review of documentary evidences on the three case studies. The interviews were designed to tap lived experience and interviewees were selected from the top

management of different key stakeholders on each case study. Each interview lasted between 40 minutes and 90minutes. Notes were taken during the interviews which were conducted in the second half of 2010 and were staggered to one case study per month. This spacing of interviews enhanced establishment of good contact and firm arrangement in term of the date and venue for the interviews . Moreover, the spacing of the interview also helps the compilation of information and progressive analysis of data.

The interviews were recorded using a digital voice recorder (VN-8600PC) and pictures were equally taken on site to document some salient information on the state of the market during the visit. The recorded interviews were subsequently transcribed. Other anecdotes of personal observation and review of documentary evidences were then analysed and interpreted to derive the key risk factors that affect the smooth execution of the PPP market, the impacts of these risk factors on the market and the mitigation method employed.

8.2.2 Qualitative data analysis

As with data collection, several specific analytic techniques are relevant for qualitative data. Of these, focusing on procedural categorisation, Madill and Gough (2008) divided modes of performing qualitative data analysis into (i) discursive, (ii) thematic, (iii) structured, and (iv) instrumental. See Madill and Gough (2008) for detail descriptions of these strands of qualitative data analytic techniques. Yin (2009) expanded these and classified them into five as follows; pattern matching, explanation building, time-series analysis, logic models, and cross-case syntheses. He recommended that for all these five techniques, similar replication logic should be applied if a study involves multiple cases. Therefore, since this study involves three case studies, a replication logic presented in chapter 6 was employed. The analysis focused on extracting and corroborating meaning from the interviews which were analysis by means of qualitative content analysis. Content analysis can be either be qualitative or quantitative or structural (Fellow and Liu, 2008). According to them the choice is dependent on, the nature of the research project and the issues to be addressed in the research if they are known. Qualitative content analysis employed in this study involves a scrutiny of discussions to establish meaning and intentions. Here data are given codes to categories and group information from respondents. For instance in this study, risk identified by public partners are given a code different from the ones identified by private partners in the same way different from the consultants on the project. The intension is to develop a

matrix of categorised data against groups. Qualitative content analysis approach has been used in construction research in the past, e.g by Goodman and Chinowsky (2000), Lingard et al. (2000) and Chinyio and Akintoye (2008). The analysis was carried out using NVivo software. After transcription of recorded interviews, these are imported into the NVivo and the coding was done following the risk management process i.e. risk identification, analysis and response.

Furthermore, aside from the qualitative content analysis, a cross-case synthesis analysis was carried out using the concept of Triple Bottom Line (TBL). TBL is a popular concept in accounting and management. The concept incorporates three dimensions of performance: social, finance and environment. Others refer to the concept as the three 'Ps'. i.e. people, planet and profts. The following are some of the aspects that need to be examined under each dimension of TBL. (i) Social- community and social impact, health and safety issues, fair compensation, equal opportunity, education and recognition. (ii) Finance- revenue growth, productivity, profit margin, return on investment, capital cost, risk management, valuation of enterprise and appeal to investors. (iii) Environment- the use of energy, water and material use, emissions and waste, operational and design efficiencies, new product and service opportunities. These amongs other was used to assess the performance of the case studies. The summary of the results of these analysis are presented in the following section.

The structure of the presentation of each case study involves three main steps: (i) a brief write up on the general background information to each case, (ii) a write up of the findings from the individual case analysis and (iii) writing a cross case analysis.

8.3 Background information on selected PPP markets projects

This is the first part of the analysis of the qualitative strand of the study. Brief histories of the PPP markets selected as case studies are given in this section. More importantly, specific project information: such as the construction period, the initial construction duration, the initial contract sum, the final contract sum, and the concession period are discussed. Moreover, parties to the contract are identified equally for each case study reported in this section. The background information served as baseline data from which the findings of the study can be compared, to understand whether there are variances or divergences from the plan in terms of the actual performance of the market.

8.3.1 Case study 1: The Reconstruction of Erekesan Market in Akure

The first case study is the Reconstruction of the Erekesan market in Akure, the Capital of Ondo State. Akure, the State capital, covers an area of about 20 square kilometres. The town is situated 204 kilometres East of Ibadan, 168 kilometres from Benin, the Edo State capital and 311 kilometres from Lagos.

Erekesan market was re-constructed following the destruction of the old King's market (Deji's Market) by fire in the year 2000. Based on the zonal classification of the city of Akure by Olanrewaju (1996), the Erekesan market (i.e. the King's Market) is situated in the inner core of Akure, consisting of zones labelled 1-4 as shown in figure 8.1. The area is composed of old family quarters, and the ancient palace of the king, the general post office, central mosque and the market area. The site of the market is immediately in front of Deji's palace, along Oba Adesida road, in the centre of Akure town. The location of the market means that it falls under the jurisdiction of Akure South Local government. Oba Adesida Road is the hub of commercial activities, with some adjoining streets. Most of the important streets or roads link up with the arterial four-lane road, making it an ever-busy location. Virtually, all the banks in Nigeria have their offices on the road. Oba Adesida Road, stretching about four kilometres is the beauty of Akure, with modern architectural buildings that serve mostly as offices (see figure 8.2 for a Section of Oba Adesida road taken from the pedestrian bridge in front of the market).

Agreement to redevelop the Old market into an ultra-modern market was reached between the Ondo State government, Akure South Local government (public) and Spring Bank plc - then Omega Bank Nigeria PLC (private). The trio formed a special purpose vehicle (SPV) company called Sunshine International Venture Limited (SIVL) under a Joint Venture agreement. The concession agreement was to jointly finance the project with the bank providing much of the finance. Akure South local government provided the land as its share of the equity, while Ondo State government contributed 20% of the fund. A two-year construction period was agreed and the market was to be operated for a period of 20 years before being transferred back to the government. Six contractors were involved in the construction as the whole project was divided into six packages. Block A, B, C, D, E and the Traditional market side. Omega Bank Plc., through its subsidiary mortgage company Omega Saving and Loans, managed the

project, while private consultants were employed to design and carryout the initial documentation of the project (see figure 8.3 for a diagram of the market).

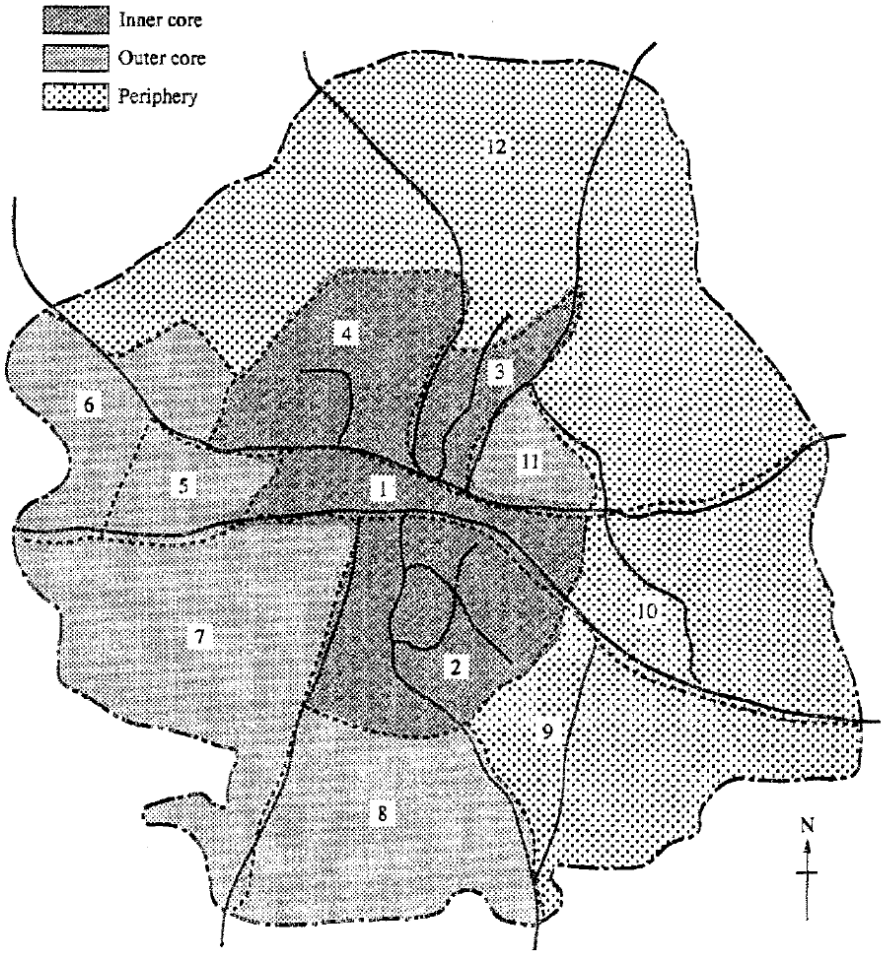

Figure 8.1: Zonal Classification of Akure Showing the location of Erekesan market.
Source: Adapted from Olanrewaju, (1996).

Figure 8.2: Showing a section of Oba Adesida road taken from the overhead bridge in front of Erekesan Market.

Figure 8.3: Front view of Erekesan Market in Akure.

8.3.2 Case study 2: Oluwole Urban Market Complex (OUMC) in Lagos Island

The Oluwole Urban Market Complex emerged from the redevelopment of the old Oluwole market. The old market had become notorious for fraud and was home to drug addicts prior to the redevelopment. The local markets were characterised by makeshift stalls that were generally mismanaged and unsanitary. Oluwole Urban Market Complex (OUMC) was developed as part of the entire redevelopment plan instituted by Lagos State government to regenerate and rebuild the historic Lagos Island. This fell under the "Lagos Island Central Business District Revitalisation/Marina City project". The project was a five-year project intended to be jointly executed by the Lagos government and the private sector, to help revitalise the area and to restore the Central Business District (CBD).

The market is bordered by Martins Street, Breadfruit Street, Nnamdi Azikwe Street and Ali Balogun Street in Lagos Island. OUMC is a four floor level concrete structure covering a floor area of about 3,889 square metres with 384 shops and 294 K-Klamps (traditional market stalls) on a site measuring 4,829 square metres. The project is a PPP initiative between Lagos State Development and the Property Corporation (LSDPC) as

the pubic partner, and ARM Properties Plc. and AZDEC ASC Design Company as the private partner. The three formed a special purpose company called 'The Oluwole Urban Mall Properties Limited' (OUMPL). OUMPL was given a concession to build and operate the market for 25 years. The construction of the market commenced in January 2008 and was completed in December 2009. The market was officially commissioned by the Lagos State governor, Babatunde Raji Fashola in April, 2010 (see figure 8.4 for picture of the market).

Aside from the 384 lock up shops and 294K- Klamps, other facilities in the market include 100 toilet facilities distributed, 25 on each floor, 2 good lifts, standby electricity supply, portable water supply through bore holes, 24-hour security, merchandise loading bays and ramps. The mark*et al.*so has an onsite facilities manager. The development was planned to take place in two phases. The first phase is the Oluwole Urban Market, and the second phase was the development of additional shops, offices and a multi-storey car-park. The design concept used for the market involved the use of an introverted shop layout arranged around atriums and voids. The shops and K-klamps were placed in the same place and three atrium voids unite the internal structure and provide visibility to all floors and shops. Moreover, the peripheral circulation of internal courts allows uniform shop exposure to all customers.

Figure 8.4: Picture of Oluwole Urban Market Complex in Lagos Island.

8.3.3 Case study 3: The Ikeja Cantonment Ultra Modern Market Complex in Lagos

It is customary for military barracks to have schools for the children, a health centre for barrack residents and markets for officer's wives. Similar to the other two case studies; Ikeja Cantonment Ultra modern market was developed to replace the old makeshift Mammy market, which formerly served only residents of the military cantonment. In 2002, a bomb blast in the cantonment reduced many of the buildings within the barracks to rubble, including the mammy market (see figure 8.5 for the relics of the site after bomb blast). In a bid to redevelop the mammy market following the blast, the Nigerian Army collaborated with a firm of developers, Woobs Resources Limited to develop an ultra-modern shopping complex to serve as a commercial outlet within the confines of the Cantonment in Ikeja, Lagos. The development was a joint venture (JV) initiative between the Nigerian Army and Woobs Resources Limited, with the former providing the land, and the latter providing the finance and handling the development of the market on a build, operate and transfer (BOT) basis, christened "The Arena".

Figure 8.5: Picture showing the relics of the mammy market before redevelopment

The Arena is located in the heart of the Mainland and highly accessible from the Oshodi/Agege Expressway. The main access to the market is from the Bolade Bus Stop in Oshodi along the Agege Motor Road. However, unlike the former mammy market, the new one is divided into four sections. The first comprises of an open-shop arrangement on a single floor, while the second section comprises of lock-up shops over

two floors. The third category is the warehouse section, while the fourth is the entry lock-up systems, which are also on single floors. All together, the shopping complex has 3,617 lock up and open stalls. The developer (Woobs Resources) was granted a 24-year lease from the Army authorities and a two-year moratorium for the construction. The agreement was to finance, construct, and develop an ultra modern shopping centre the "Ikeja Cantonment Ultra Modern Market Complex". The project was financed by Oceanic Bank International Plc, while the mortgage facility is provided by Oceanic Bank and its mortgage subsidiary as well as First Bank Nigeria Plc. Some key facilities that were formerly not associated with market developments such as an independent electricity supply, gas and kerosene powered turbines were also incorporated in the market development. A community telephone service is also provided at the site. Other services within the complex are a military police post, a fire station, bulk trade zones, ample parking space, facilities management, security, dedicated transformers, an incinerator, boreholes and pipe borne water, an abattoir and modern rest rooms. The project was formally opened to the general public for procurement in April, 2009. The final construction cost for the project was estimated at 4 billion Naira (about 16 million GBP) against the 3.2 billion Naira budgeted cost for the project. The project was completed behind schedule with a time overrun of 12 calendar months (see figures 8.6 and 8.8 for pictures of the new market).

Figure 8.6: Picture showing the open-shop arrangement in the Arena.

Figure 8.7: Picture showing the lock-up shop arrangement in the Arena.

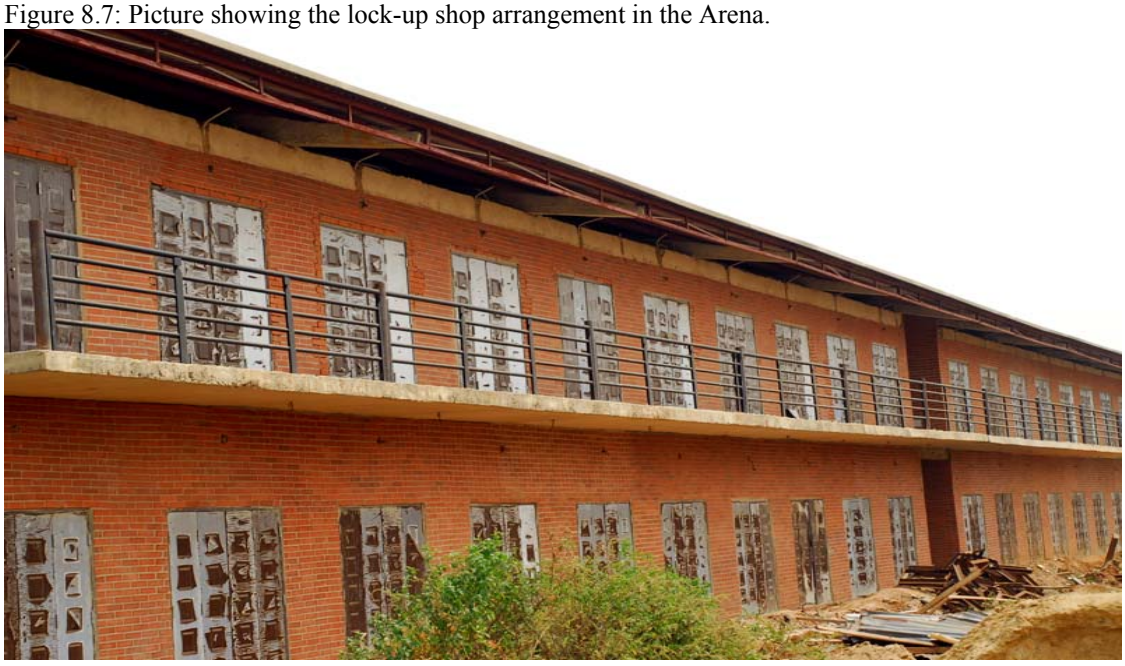

Figure 8.8: Picture showing the lock-up shop arrangement on two floors.

8.4 Discussion of findings on Erekesan Market Akure

Having discussed background information relevant to the case studies, the next section will report the findings from the interviews conducted on a case-by-case basis. This section presents the findings on Erekesan market in Akure. Five key sets of stakeholders were identified on the project; viz: (i) government (i.e., Ondo State government and Akure South Local), (ii) bank, (Omega bank Plc.), (iii) contractors (Six of them), (iv) consultants, and (v) end users (Traders and Shoppers at the market). These were all consulted in order to gather convergent evidence, regarding the risk events that occurred in the project, the possible impact of these risks on the project delivery and on stakeholders' satisfaction, and the possible mitigating measures.

8.4.1 Risk encountered on Erekesan market project

Semi-structured interviews were conducted with the different key stakeholders, as shown in table 8.1. From the table it is evident that interview subjects otherwise referred to as interviewees were the real information gatekeepers (i.e. top management officers) among the stratified groups. This gives an assurance that whatever information they supplied was genuine information that could be relied upon for this study. For consistencies in terms of the conducting of the interview, a case study protocol (CSP) was used. This helped the researcher to maintain focus on the key objectives of the study as well as to ensure that all the respondents were asked the same set of questions in a logical manner. Respondents were also asked to evaluate the performance of the project in terms of the three main project success criteria; i.e. time, cost and quality. From the interviews, the interviewees attested to the fact that the reconstruction of the market began in October 2004 and was completed and commissioned in 2007 with an initial contract sum of ₦450 million and a final sum of ₦600 million. This implies that the project experienced both time and cost overrun (about 12 months and ₦150 million approximately £683,123.449). Although, the interviewee from the state government side actually resented the final contract sum declared, which he argued did not represent the actual cost of construction, rather the total cost to the sponsor. He asserted that the ₦600 million that the sponsor was claiming as widely reported in the daily newspapers included the interest on the loan used to finance the project.

Table 8.1: Categories of interviewees on Erekesan Market

Group	Interviewee	Designation in the establishment
Ondo State Government	Engr. Olusoga	Senior Special Adviser to the Government on Infrastructure.
Akure South Local Govt.	Mr.Aladesuyi Taiwo	Chief Quantity Surveyor
Omega Bank Plc.	Mr. Gregg Adeyeye	Regional Manager
Consultants	Engr. Olufemi Ojo	Senior Engineer Atlor Engineering Limited
Contractor	Pastor Fagite Ajayi	CEO Gaf & Sons.
Market leader	Mrs Lawal	Women leader

Furthermore, respondents were asked to describe some of the problems they encountered in the course of developing the project. For ease of presentation, the

problems were grouped under three main headings viz: Pre-construction phase, Construction phase and Operation phase.

The Pre-construction phase:

From the interviews, it was apparent that the delay in contractor selection and the prolonged negotiation following selection were major problems at the pre-construction phase of the project. Interviewees reported that contractors had to tender for the project on three consecutive occasions before six contractors were picked to handle the project. Negotiation with these contractors also took a long time before agreement was reached on who should handle which part of the project. Consequently, the inflation affected the project, making the contractor's tender unrealistic by the time work started on site.

Moreover, the respondents explained that even when the contractors were given possession of the site, the project sponsor attached some additional stringent conditions to the mobilisation of the workforce. This included the need for collateral for the fund, before the bank could release funds to contractors, especially those who did not operate accounts with the sponsor. In addition, the contractors' banks were charging between 1-2% of the money as administrative charges, which according to the contractor was not planned for. However, the contractor interviewed said they were able to overcome these problems by using their houses as collateral and by entering into agreements with suppliers to supply them materials and to then get paid as soon as they received their payments based on the valuation of work done. In the opinion of the sponsor, the respondent asserts that these conditions were put in place to reduce the risk of non-performance and also to provide incentives or motivation for the contractors to do a good job, knowing that good performance was a pre-condition to payment.

In addition, respondents from the contractor's side also mentioned the problems they encountered, including having to forcefully displace traders who were using the site before work could start on the site. It was reported that because the site was the site of the old King's market before being destroyed by fire, the previous users erected makeshift stalls and continued their businesses. Getting them out of the site without planned relocation prior to construction generated much opposition and the services of police and civil defence forces have to be used. This, according to the contractor affected output, since much time was wasted on maintaining law and order on site rather than on doing the work. In addition, the cost of hiring civil defence officers and taking

care of the police according to the contractor's requirements was not included anywhere in the bills relating to quantities.

The Construction phase:

The construction phase of the project was not without its own problems. During construction, the project had to stop for about three months due to an error in the site information prepared by the consultant land surveyor. It emerged that a portion of the market was going to affect a historical site and an important palace building. It was assumed that the site was where the late Kings were buried; the building is so important that every newly designated King has to visit the building for traditional rites before being crowned king. All interviewees confirmed this problem and the contractor interviewed also added that he had to re-start setting out all to give room for the adjustment, which caused him a lot of money and time. Confirming the claim, the respondent from the sponsor's side asserted that the problem is a consultant error that led to an increase in the cost of the project. He explained further that the geotechnical report produced in reference to the site was also not correct; the report claimed that the site was a firm site on solid ground, but a portion of the site was waterlogged, and some areas were old dump-sites, which led to additional costs for excavation much beyond the amount budgeted.

In addition, it was also reported that during the construction phase, there was considerable disruption to construction work as a result of the many rituals that needed to be performed within the confines of the site at the kings market; especially since the city was in the process of installing a new king at the time. Moreover, interviewees also mentioned some other instances of disruption occasioned by festivals in the city, which required that the central market/kings market be closed to allow the festival to go on. Fluctuation in the price of key construction materials like cement and reinforcement bars was another problem that occurred during the construction phase of the market. Respondents claimed that there was serious inflation during the period of construction, which saw cement moving from ₦750 to ₦1,800 and a 12mm diameter reinforcement bar from ₦96,000/tonne to ₦140,000/tonne. Furthermore, during the construction, there was a tree in the traditional market section, which the indigenes insisted must not be touched by the construction team. Consequently, the design for that portion of the market had to change; the sponsor argued that this led to a loss of a numbers of stalls which affected their cash inflow forecast.

The Operation phase:

The interview result revealed that when the market finally opened for use and it was reported in the news that some portions of the market had been designed with the intention of selling them to prospective traders, the idea was unpopular with the local people who argued that it is 'an abomination' to sell the King's market (or part thereof) to an individual. Moreover, because the majority of the local people, who were former users of the market could not afford to pay the amount charged for a space in the market, complained to the newly installed King. Consequently, the market was forced to close for another six months. In the opinion of the local people, i.e. those who were Akure indigenes, "the King's market" (Oja Oba) should be free for all, only a small tariff need be taken from traders based on their daily sales, as was the practice prior to redevelopment. The market should accommodate the market women who are selling traditional goods such as herbal leaves and to hens and goat sellers who have been using the old market before without paying. One respondent remarked thus, "you *know Oja Oba is an embodiment of our rich cultural heritage and thus must be preserved*". Personal observation as well as documentary evidence confirmed the fact that the local people cannot afford the price of a space in the market which was set at between ₦3,000.00 - ₦4,000.00/month, amounting to about ₦36,000 – ₦48,000 annually for a 5.76m^2 shop. Indeed, some market women could be seen trading by the road side although many shops are as yet unoccupied (see figure 8.9 for traders selling goods outside the market). Furthermore, documentary evidence reveals that since the commissioning of the market in 2007, the occupancy rate has been static at around 50%, as was the case when the researcher visited in August 2010.

Figure 8.9: Traders selling outside the Ultra modern market

Interestingly, during informal interviews with some of the traders, it was revealed that some of the facilities in the market that were used to justify the huge sum of money the developers are charging were not functioning. For example, the toilet facilities in the market are not functioning because of inadequate water supply and there are 5 non-functioning boreholes in the market due to unstable power supply. The implication of this is that there is no portable water to drink in the market, the toilets are not functioning and the erratic poor power supply is affecting trader's daily sales. Aside from the high price of a space in the market, another reason for the low occupancy rate was that traders do not want to stay in the shops on the first floor. They explained that it will be difficult to persuade customers to climb up to the first floor when he/she can get what he/she wants on the ground floor. More so, shops on the first floor do not have ceilings making them prone to theft and vandalism.

Another problem that was encountered on the project was a lack of commitment on the part of the government as a result of a change in administration. It was gathered that shortly after the commissioning of the project, the new governor administration was unwilling to continue with agreements made between his predecessor and the private sector, especially when there was public opposition to the market and the sponsor was proposing upfront payment of the money invested from the public as partners.

In summary, based on the findings from the semi-structured interviews conducted and on personal observations, it can be concluded that the problems encountered on the

Erekesan market development using PPP markets concern the following: (i) prolonged contractor selection and negotiation period, (ii) availability of finance, (iii) faulty tender documentation, (iv) persistent closure of the market due to traditional festivals in the city, (v) opposition by the local people preventing non-indigenes from taking a larger percentage of the market, (vi) economic status of the local people who were the former users of the market before it was destroyed by fire (vii) the amount traders have to pay for a space/stall in the market, (viii) unfriendly design, (ix) inappropriate size of the facility, (x) inadequacy of parking spaces, (xi) change in the government, and (xii) the relocation of the former users of the market.

8.4.2 Impact of these risk factors on Erekesan market project

From the above discussions reflecting the problems encountered in all of the three phases identified above, it is arguable that it is unsurprising that these problems have had tremendous impacts on the success of the project. As mentioned earlier when describing the background information relevant to the market, the project was delivered behind schedule and above costs and with a poor quality (a time overrun of about 12 months -compared to 12 months scheduled- and a cost overrun of about ₦150 million from the original budget of ₦450 million).

It is obvious that the poor time scheduling, and the cost and quality performance of the project can be traced to all the above problems. Moreover, in terms of client and stakeholder satisfaction, it is evident that the sponsors were unhappy with the poor inflow of traders and customers to the market. In the same vein, end users were generally unhappy with the market. One of the respondents described the market as a *"Monumental loss to Ondo State in general and Akure-land in particular"*. Some were even calling on the new government to demolish it and build another one, a replica of the neighbourhood market the new administration was building across the State. The respondents shared their opinions that those neighbourhood markets being built by the new administration are more user friendly and are affordable to all (see figure 8.10 for a picture of an on-going neighbourhood market; Isinkan market in Akure).

Figure 8.10: Neighbourhood market in Isinkan, Akure

8.4.3 Mitigation measures employed in managing those problems

Judging by the performance of the project in terms of cost, time and quality, and the opinion of interviewees, especially those on the consultants side, contractors as well as public partners, the project labelled unsuccessful. It can be argued alternatively that the fact that the major aim of redeveloping the old market into a modern day market befitting the centre of a capital city was realised, is enough credit to the sponsor. This also attests to the fact that something has been done to reduce or eliminate these problems. Therefore, in line with the research objectives, the respondents were asked to highlight some of the mitigation measures that were employed in the project.

It was observed that for equal distribution of shops in the market between indigenes and non-indigenes and without interfering with the cultural heritage of the people, the shops were shared between parties. The government was also to subsidise the price of stalls a little for locals; those in the traditional section of the market were given to the market women who were trading in traditional goods like herbs, cola, goats etc. for free. Moreover, it was agreed that during any festival, only the traditional market section will be closed while normal business activity will be allowed to continue in the other section of the market. The government also agreed to bear the construction costs from the private partners over three instalments. Traders in the market suggested adequate consultations with the end users in the case of any future development as they felt this could help reduce some of the problems early on. They stated that this type of consultation will help the developer to understand their needs, and also what they can afford.

8.5 Discussion of findings on Oluwole Urban Market Complex

From the background information provided on this market, many stakeholders in the project were identified; the main parties to the contract are as follows:

(i) Lagos State Development and Property Corporation (LSDPC) –Concessionaire

(ii) Asset and Resources Management(ARM) Properties Plc. – Co-Sponsor

(iii) AZDEC A.S.C Design Consultants- Sponsors.

Other groups of people that were involved in creating enabling environment for the development of the market are as follows:

(A) State government ministries and parastatals:

(i) The Governor's Office

(ii) Ministry of Physical Planning & Urban Development,

(iii) Lagos State Urban Renewal Authority (LASURA),

(iv) Lagos State Physical Development Authority

(v) Ministry of Housing and

(vi) Ministry of Justice

(B) Consultants:

(i) ARM Investment Managers- Financial Adviser

(ii) The New Practice- Legal Advisers

(iii) Rabiu Mid associates- Quantity Surveyor

(iv) Briscoe Properties Limited- Project Manager

(v) Poolad Consult Limited- Mechanical & electrical Engineer

(vi) Data Consult- Structural Engineer

(C) Contractor:

(i) Dys Trocca Valsesia (DTV)- Main Contractor

(ii) Kenol Nigeria Limited- Electrical & Mechanical Contractor

(iii) Nigerite Limited- Roof Contractor

(iv) Syndicated Metal Industries Limited (SMI) Aluminium Works

(v) Mazin Engineering Limited- Roller Shutter Doors

(vi) Sanei Lifts- Lifts

(vii) Powercraft Engineering Limited- Water Treatment and Borehole

(viii) Jubaili Bros Limited - Generator.

Due to time constraints and the busy schedule of the stakeholders, interviews could not be conducted with them all, but to acquire a good representation, interviews were conducted with top management officers from the three main parties to the contract as was highlighted previously. The presentation will follow the same pattern as that presented with the Erekesan market.

8.5.1 Risk encountered on Oluwole Urban market project

As with the Erekesan market, the risk encountered on the Oluwole urban Market development can also be divided into three main phases viz: pre-construction, construction and the operation phase.

The major problem reported on this market project relates to the former owner of the Oluwole site. Given a background history of the location, an interviewee from LSDPC explained that the Oluwole area was originally acquired by the Colonial Government in 1951. It was reported that the Colonial Government issued an Acquisition Notice to acquire over 2,500 hectares of land with the intention of renewing the area later, based on an urban model. However after the acquisition by the government and subsequent payment of compensation to owners and occupiers, they did not move out for various reasons. Instability and lack of continuity in government policy led to the ineffectual implementation and enforcement of eviction. This remained the situation until the former Lagos State governor, Asiwaju Bola Ahmed Tinubu, revisited the urban renewal challenge in the year 2000 and reached an out of court agreement with the various parties involved in the litigations related to Oluwole. At this time 79 occupants, whose properties were acquired, received compensation and 40 of these were resettled in the Ogba Housing Scheme. Therefore, when the idea of re-building the area into a modern market came up, it became necessary to explain the government's intentions to the remaining 39 families who were still occupying the site, so as to re-negotiate the compensation issue with them.

It was discovered that the government and the consortium of developers had to negotiate with these thirty-nine (39) different interest groups in an exercise that was described being very hectic. The Lagos State Governor, Alhaji Raji Fashola during the commissioning of the market equally attested to the rigour both parties were put through during negotiations with the leaders of the former owners of the market site. He was quoted as saying:

"*Distinguished ladies and gentlemen, the negotiations were by no means easy. I had to chair several meetings with each of the leaders of the 39 different interest groups and I was assisted by members of the Ministry of Physical Planning and Urban Development, especially the Hon. Commissioner, TPL Franciso Abosede, the Ministry of Justice, led by the Hon. Attorney General, Mr. Supo Shasore, the Lagos State Development and Property Corporation led by Mr. Biodun Oki, the General Manager LASURA, Alhaji Sulaiman, and especially by Mr. Yemisi Coker who acted more as an arbitrator between the Government and the various family interests*" (Fashola, 2010).

Furthermore, it was reported that on the eve of the day the main contractor was to move to site for the construction phase, there was an unusual fire that engulfed the site, which if not for the help of the officers and men of the Fire Service supported by the Police, could have been a serious setback because the contractors had already moved some of the major equipment to site. The fire slowed down construction activity. In addition, it was reported that during the construction phase there were many court injunctions attempting to prevent the construction, due to several applications made by certain persons to the Lagos High Court. Other challenges during the construction phase were;

(a) Problem of how to humanely move the densely populated active Oluwole shopping community.
(b) How to cope with resistance to change by the people of the area.
(c) How to re-house the 39 occupants' resident on the site.
(d) How to engage and involve the Omoonile (i.e. thugs who lay claim to ownership of the area and force people to pay for anything they want to do in connection with the area) in the development of the market.
(e) Difficulty in moving materials to the site due to busy nature of Lagos Island.
(f) Incomplete design which actually required further modification from the Architect.
(g) Variation.
(h) Late payment and delays in issuing instructions.

The operation phase of the project also had its own challenges. Some of the challenges identified by the interviewees from the sponsor's side are problem of how to ensure that former traders in the market, both large and small scale, are afforded the opportunity to buy shops. Moreover, according to the respondents, another serious problem was how to keep people away from the site, for health and safety reasons. The reason why this was

important is that Oluwole is identified as a slum and an enclave of criminals who specialise in forgeries and sophisticated crime, such as international passport racketeering, credit card fraud, drug cartels, certificate, currency and visa forgeries among others. The developer needed to deal with these people and keep them off the site. The head line in Figure 8.11, which is culled from the Punch, a daily newspaper in Nigeria, attests to the poor condition of the place and the notoriety of the people of Oluwole. The paper reported that *"The Lagos State Governor, Mr. Babatunde Fashola, has inaugurated the first phase of the New Oluwole Urban Market in Lagos Island, which was built into a modern edifice from a previous urban slum.*, This confirms the fact that Oluwole was a slum area prior to the redevelopment. Moreover, governor Fashola equally attested to the sophistication of crimes in Oluwole area in his speech when he commissioned the project in April, 2010.

Figure 8.11: Paper headline on the official commisioning of Oluwole market

8.5.2 Impact of these risk factors on Oluwole market project

When interviewees were asked to identify the impact of all the aforementioned challenges on the project, there seems to be discrepancies in their opinions. Whereas the sponsors, the internal stakeholders, asserted that the project was a huge success, the end users, i.e. traders, were of a different opinion. For example, the managing director of ARM properties Mr. Yinka Ogunsulire said, "*At Oluwole, our aim was to provide for the different layers of the existing retail space demand as well as encourage new and complementary uses. We provided stalls for the petty traders and hawkers that are*

characteristic of this area of Lagos, small and medium line shops for the garment and consumer goods shop owners and on the top floor small business units for the myriad of businesses (insurance companies, microfinance banks, telecom company customer centres, etc) that service the market population. This is akin to the bottom of the pyramid strategy, where we offer the basic features and conveniences of formal office and trading platforms in little dose to small entrepreneurs and traders. This has proven to be a high yield product". This assertion can be considered as an affirmative statement pointing to the fact that the project was judged a success. However, looking at the price list of the shops in the market, as shown in Table 8.2, and going by the reactions of traders in the market, it is apparent that while some are satisfied with price, the price is exclusionary to some. For instance, during a visit to the market in October, 2010, some of the stalls remained locked while others were empty; though the researcher was informed by the representative of ARM in the market that all shops have been sold to traders. A shop owner said "*the project provided us with an easy and convenient means to acquire a shop within the highly commercial Lagos Island"*. Another shop owner said, *"The quality of work on the project is commendable"*. Some other shop owners interviewed remarked that they could not reach a conclusion as yet, since the facility was still very new, but they would be able to discuss the performance of the market after two or three years.

In the opinion of other shop owners, the cost they pay for a stall in the market is high compared to what is available elsewhere within the Island. They alleged that all the shops had initially been bought by rich people who were now selling them on at an exorbitant price to poor traders. From the information gathered from the representative of ARM in the market at that time, all the shops had been sold and discovering some of the shops locked would appear to attest to the fact that those taking the shops might not necessarily be traders. A recent report in the National Mirror of 10th of January 2011, confirms the fact that traders cannot afford the price a space is going for in the market (see figure 8.12 for a newspaper report on the status of rent in the market). The paper reported that traders at the Oluwole area of Lagos Island Central Business District seem to have shunned the modern Oluwole Urban Market citing exorbitant costs. This also attests to the fact that, although the aim of redeveloping the area from a slum to a modern shopping centre has been achieved, the end users cannot afford the prices of spaces in the market. Moreover, the time and cost performance of the project

construction is poor going by a completion time of 2 years 4 months instead of a year and the final cost of ₦1.2 billion as against an initial estimated cost of ₦851 million.

Table 8.2: Price list for Shops in Oluwole Market for 25 years lease

ITEM	DESCRIPTION	AREA/SPACE	UNIT	AMT/25 YRS	Amount/month (N)
A	**GROUND FLOOR**				
	K- Clamp	2.88	m2	520,000.00	1,733.33
	Type A	8.64	m2	5,720,000.00	19,066.67
	Type C	20.16	m2	18,200,000.00	60,666.67
	Type D	20.6	m2	19,500,000.00	65,000.00
B	**1ST FLOOR**				
	Type A	8.64	m2	5,010,000.00	16,700.00
	Type B	11.52	m2	7,800,000.00	26,000.00
	Type D	21.6	m2	13,000,000.00	43,333.33
C	**2ND FLOOR**				
	Type A	8.64	m2	4,300,000.00	14,333.33
	Type B	11.52	m2	6,800,000.00	22,666.67
	Type D	21.6	m2	10,800,000.00	36,000.00
D	**3RD FLOOR**				
	Type A	8.64	m2	3,600,000.00	12,000.00
	Type B	11.52	m2	5,600,000.00	18,666.67
	Type D	21.6	m2	9,100,000.00	30,333.33

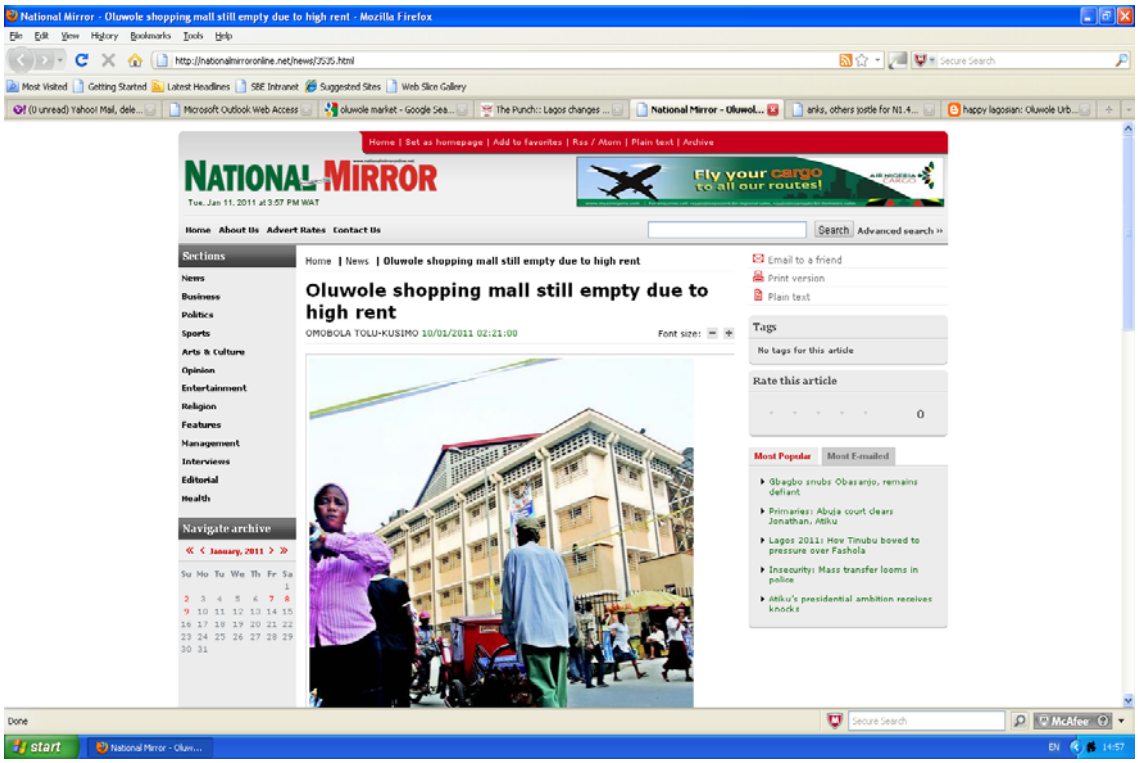

Figure 8.12: Paper cutting on the status of rents in the Oluwole Shopping mall.

8.5.3 Mitigation measures employed in managing challenges on Oluwole shopping mall development

Interviewees identified the following as some of the measures undertaken for the purpose of mitigation or as solutions they proffered to address the challenges they faced on the Oluwole shopping mall development. It was observed that several consultation meetings were held with different stakeholders in the development, for instance aside from the key stakeholder, other external stakeholders like the retailers formerly occupying the site, the families who are resident in the area and the Omooniles (the thugs who claim ownership of the area and force people to pay for any development in connection with the area). After due consultations with the stakeholders, 3 month's notice was given to the retailers through the LASURA to give them adequate time to find alternative premises for their businesses. Moreover, families who were former occupants of the area were counted and verified by the Ministry of Physical Planning, and 2 bed room flats were given to each of the thirty-nine families (39) in the Shasha residential housing estate, in the Alimosho local government area of Lagos State. In addition to this, assistance was given to the residents to move their belonging to their new apartments. Moreover, K-klamps in the market were built and sold at below market price with an instalment payment plan put in place for the local community. Furthermore, the Omoonile were used as labourers on site and as security guards; placing all security within their charge so that they will refrain from vandalising the site. Aside from this, the Omooniles were given operating licence for an adjacent part of the site, which is intended for development in the second phase of the project into a car park, which will allow them to make money after completion of the project and so keep them happy. As a testimonial to this one of the former residents that spoke with us said in pidgin English that *"when dem do dis Oluwole ... dey no forget us, nah we help dem"*. Meaning they (the previous occupants) are all instrumental to the success of the project, so that when the project finished the developers did not forget them. In addition, to solve the problem of material transportation, materials have to be moved in the night when the traffic is reduced so the Omooniles were also employed to transport those material to the site, otherwise the materials would not arrive. Moreover, some subcontracts were awarded to government agencies (normally, statutory regulators) to 'buy' their support for the project.

8.6 Discussion of findings on Ikeja Cantonment Market ("Arena")

Semi-structured interviews were conducted regarding information gatekeepers on this project. This section of the study therefore presented the findings of both the formal and informal interviews conducted with the respondents. Table 8.3 shows the list of key stakeholders in the project as identified from the background information provided about the project.

Table 8.3: Key Stakeholders on Ikeja Cantonment Market

Name of Organisation	**Responsibility/Role in the project**
Nigerian Army	Concessionaire
Messrs. Woobs resources Limited	Sponsor
Oceanic Bank International Plc.	Financier
Bridge ways Global Project Limited	Consultants
Omecon Integrated Engineering Limited	Consultants
Yemare Heights	Consultants
Tower Cost Associates	Consultants
Oat Construction Limited	Contractor
Benchmark Nigeria Limited	Contractor
Shape Heritage Nigeria Limited	Contractor
Conney Nigeria Limited	Contractor

Parties to this contract or stakeholders on this project can be categorised into five groups as shown in table 8.3, which are as follows: (i) the concessionaire, (ii) sponsor/developer, (iii) financier, (iv) consultants, and (v) contractors. With this classification, five interviewees were selected comprising of one from each group and formal interviews were conducted with them on the project. Furthermore, informal interviews were also conducted with other stakeholders like the traders as well as shoppers at the market.

8.6.1 Risk encountered on Ikeja Cantonment market (The Arena)

As in the two previous case studies, challenges to this market, as revealed by the respondents, can be said to be multi-faceted. It was reported that numerous challenges were encountered before construction on site, during construction on site and many exist still, during the operational phase.

Challenges during pre-construction phase of the project:

It was uncovered from interviews with the representatives from both the concessionaire and the developer, i.e. Nigerian Army and Woobs Resources Limited that at the pre construction phase of the project, one major problem was how to get the local community, i.e. the residents of the barracks to support the project. The mammy market traditionally was for the wives of military officers and the inhabitants of the barracks where the market was situated. For instance, it was reported that there was serious opposition from the women (i.e. the officers' wives), who felt threatened that the price of the market, based in the proposed standard and the quality of the infrastructure intended to provide might no longer be within their reach. Moreover, some army officers believed it would amount to a security threat if outsiders were allowed to buy and sell in the mammy market.

Moreover, having secured the consent of the concessionaire and the buy-in of all the residents, the next problem was the issue of funding. It was reported that some of the financiers that had previously agreed to fund the project backed out due to changes in their management. This, according to the developer, slowed down the work process. In the absence of funds, the development could not progress. Quoting one interviewee from the developer side, *"it took us much time before bringing Oceanic Bank International Plc on board to fund the project, with First Bank and Fin Bank Nigeria Plc serving as co-funders".* In addition, with the funds in place, the next problem according to the respondents was how to find a good and credible contractor to execute the work. Due to stringent conditions from the lender, the interviewee asserts that they could not afford to just select any contractor for the work; also, since the arrangement was new in the country, they had to take every precaution to ensure good contractors were selected. It was noted that when contractors were first selected and the project was to start, there were serious problems regarding how the contractors themselves could prove their financial capability. This relates to the Advanced Payment Guarantee demanded from the contractors. It took almost another 6-8 months for the contractors to acquire and those who could not get it were dropped from the list of contractors.

Construction Phase:

During construction, major problems were identified are as follows: (a) Finance problems; as discussed earlier respondents agreed to the fact that funding or finance is a serious problem at this market. The contractor interviewed asserted that in the case of the contractors involved, the major problem is finance. He explained that, for as an indigenous contractor, securing working capital is not easy. According to him, since indigenous people have limited working capital, this makes them reliant on the bank; however, the bank does not willingly cooperate or support them, usually refusing to grant funds without collateral meaning that contractors can only access an amount which they can provide collateral to cover. This limited funding affected the speed of their output; for instance having to work on only two units at a time, since each unit is a replica with sufficient funds they could have worked on ten units at a time which would have increased their productivity. Moreover, there were a few instances of hostility from the local people, i.e. some residents of the barracks, leading to fights between the contractors' workers and the residents, also affecting the construction phase of the project.

In addition, at the time of construction there were serious price fluctuations, many key material costs increased. For example, it was reported that at one point in the construction phase of the project the price of cement was just ₦1,000 and it increased to ₦1,800, the price of reinforcement bars increased from ₦90,000 to ₦180,000/tonne (twice the original price), granite rose from ₦90,000 to ₦120,000 per 30 tonnes, and the price of sand increased from ₦25,000 when the project started to ₦35,000 before it was finished.

Operation phase

The main problem reported at the operational stage of the project was how to get people to rent the shops and then also how to persuade shoppers to patronise the shops. From the traders' point of view, daily sales in the market were not very high. A reason advanced for this was that many of the customers were afraid to visit the market because of the security checks required. Moreover, some of the traders noted that the presence of another shopping centre across the road, i.e. the Bolade shopping complex, has affected the market since people find it easy to shop in Bolade rather than coming to somewhere they are unfamiliar with. One of the traders at the market was very optimistic that sales would improve when those people who have secured spaces in the

market have moved into them, as prospective buyers/shoppers will have access to a variety of goods within the market, compared to the current situation where only a few people are trading. Poor patronage is affecting the profits of the traders and also the sponsors' cash inflow.

8.6.2 Impact of these risk factors on Arena market project

The impacts of these challenges are evident from the performance of the project in terms of time and cost. As earlier reported, the final construction cost for the project was put at 4 billion Naira (about 16 million GBP) against the 3.2 billion Naira budgeted cost for the project and the initial contract duration was 1 calendar year but the construction phase took two years to complete, implying a project overrun of a duration of 12 months before it was formally commissioned in April, 2009. Moreover, as a result of the cost overrun, and the need to retain the initial concession period of 24 years by the sponsor, the prices for market space has been an influential factor making it unaffordable for the majority of residents at the barrack where the facility was located. Understandably, the residents were dissatisfied with the whole development. The previous claim can be substantiated by this comment from the representative of the project sponsor who said that, "*the reason for the steep cost, was because the complex was built on a Build, Operate and Transfer (BOT) basis and the 10-year minimum period of tenancy would afford the company, which is expected to operate the complex for 24 years, to recoup part of its investment*". In addition, the interviewee from the sponsor side claimed that the facility has been grouped into four categories to allow everybody the opportunity of owning a shop in the market. The categories, according to him are as follows: (1) an open-shop arrangement, tenants are expected to pay N150,000.00 per annum, (2) the lock-up shop which goes for N180,000.00 per annum, (3) the warehouse which attracts N300,000.00, (4) the lock-up entry system costing N2.24 million per annum. However, the market women (i.e. the residents of the barracks) were not happy with this categorisation, they claimed the arrangement only creates or introduces class differences, which is not healthy within a single community. The following comments from the residents confirm this claim.

> "*In a market like this, if you neglect the former users it will fail. Go to Lawanson Market, go to Olosha, go to Ogodo, go to Ikeja, go to Balogun, opposite Trade Fair Badagry and so on, because of the prices, the markets are empty. So this market cannot exist without the masses and petty traders occupying them.*"

"*You don't expect that once we occupy the shops, we would break-even. It will take some time before the market stabilises and mind you, we have been out of business for a long time. Most of us are poor now because of three years of idleness since the market got burnt, where would we get the money from?*"

"*Look at what we sell here, just tomatoes and pepper; how are we sure that they may allow us to do the same in this new market? And even if they do, where do you expect our husbands to get millions of naira to pay for a shop for a minimum period of 10 years? It means this is no longer a mammy market. If the developers mean well for us, they should allocate a certain portion to us because not every woman is an officer's wife. It is only the senior officers that can afford the cheapest shop, which we heard goes for N150,000.00 per year. If the Nigerian Army authorities do not want a mammy market again in the barracks, they should tell us so that we can make alternative arrangements. You say you are developing a mammy market and you are introducing class difference; what kind of arrangement is that? It is discriminatory and we won't accept that*" (market women).

8.6.3 Mitigation measures employed in managing challenges on Arena shopping mall development

Respondents were asked to identify some of the strategies used to mitigate the risks to the project. The recurring mitigation measures used by the interviewees were maintaining good relationship with local government and higher officials, obtaining all necessary approvals in a timely manner to minimise the chances of corrupt individuals obstructing the work, securing standby cash flow in advance, developing clear and appropriate plans and controlling schedules and costs; obtaining payment and performance bonds from local and international banks, entering into a fixed rate loan contract with lending banks, obtaining design liability insurance, conducting market studies, obtaining accurate information on competitive projects and engaging the local community in buying into the project as well as organising a series of enlightenment campaigns to sensitise the people to the benefits offered by the market. Moreover, to make sure miscreants or unwanted visitors that could prove a security threat do not have access to the barracks through the site, uniformed men were placed in strategic locations

to watch over the site and workers or anyone that had business with the site had to carry an identity card without which he or she would not be allowed to enter the site.

Furthermore; one of the interviewees said that it was advisable not to use intermediaries to execute or make supplies for construction, and that it was necessary to involve some of the residents of the barracks in the supply of some key items like sand, granite chippings, planks, water for the work etc. in order to create 'a conducive atmosphere'. However, although the arrangement seems to work for this project, it may have contributed to the increase in the budgeted or estimated cost of construction and the time overrun. This confirms the assertion of Awodele *et al.*. (2010) that in engaging stakeholders for project management in a difficult environment, project promoters may have to adopt novel approaches that are situationally appropriate.

8.7 Cross case analysis

At this point, it is important to consolidate experiences from all the three case studies, to learn if there are any convergences or discrepancies in the cases. In order to do this, the concept of Triple Bottom Line (TBL) was adopted to measure and report the performance of the three projects. TBL was first developed in 1994 by John Elkington, the founder of a British consultancy, SustainAbility (Savitz and Weber, 2006). According to Slaper and Hall (2011) the TBL concept is an accounting framework that incorporates three dimensions of performance: social, environmental and financial. They further explain that the TBL framework goes beyond the traditional measures of profits, return on investment, and shareholder value to include environmental and social dimensions by focusing on comprehensive investment results; that is, with respect to performance along the interrelated dimensions of profits, people and the planet - triple bottom line reporting can be an important tool to support sustainability goals (Slaper and Hall, 2011).

Profit organisations and many nonprofit organisations have adopted the TBL, for instance, Slaper and Hall (2011) assert that State, regional and local government in the US are increasingly adopting the TBL and analogous sustainability assessment frameworks for decision making and performance-monitoring tools citing States like Maryland, Minnesota, Vermont, Utah, the San Francisco Bay Area and Northeast Ohio as examples. Furthermore, the Ford Foundation has funded studies that have used

variations on the TBL to measure the effects of programs to increase wealth in dozens of rural regions across the United States (Stark and Markley, 2008). Therefore, the comparison will be done based on the three pillars of the TBL i.e. People, Profits and Planet.

People:

Under this dimension, social variables of the community or region can be considered. In this situation, variables like affordability, female labour force participation rate, and access to these facilities for the local people or the residents of the area where these facilities are located form the focus for comparison. From the findings of all three case studies, it is evident that although the aim of redeveloping the markets into modern day shopping centres were met in all cases, the performance of all three PPP markets fall short of the requirement of satisfaction of the people, especially end users. As we have seen from the findings, the price of the shops is much too high for people to afford, which in turn means the facilities are inaccessible to those people they were intended to serve. Based on the fact that retail businesses throughout the economy are predominantly owned by women, the high price and inaccessibility of these markets leads to low female labour force participation in the economy of these areas, which arguably deviates from the concept of equity and access to social resources. This revelation represents a convergent finding from all three case studies.

Profit:

This dimension can otherwise be described as an economic variable. By economic variable we can investigate the flow of money, revenue from the facilities etc. From the findings of all the case studies, it is apparent that the rates of return on these projects fall below the expected return, due to poor patronage from traders. This is shown in the Erekesan market for instance where the letting rate has remained at around 50% since commissioning in 2007, and the report on the Oluwole market which suggests desertion due to high costs. This means the forecasted inflow will be unrealistic. Moreover, since the end users complain of low patronage from the buyer/shoppers in these markets, this also implies that the revenue or the profits they will be making (i.e. the traders) will be low.

Planet:

Planet refers to environmental variables. This variable focuses on measurements of natural resources and reflects on potential influences they have on project viability. It incorporates variables such as air and water quality, energy consumption, natural resources, solid and toxic waste and land use. Though the majority of these variables are not expressly measured in the study, it can be observed that all three case studies perform well in this aspect. There were notable improvements to the environment in which these facilities were built. For instance, it was revealed from the first case study that the old King's market was redeveloped after it was gutted by fire, and in the last case study that redevelopment followed a bomb blast that destroyed the old mammy market. It is evident therefore from this that there are environmental improvements in terms of the quality of the environment following redevelopment. In addition, Oluwole used to be a slum area before the redevelopment and the residents were relocated to the Shasha housing estate which should prove to be a better environment.

8.8 Summary of the chapter

The risk factors encountered during the three case studies have been presented in this chapter based on qualitative data collected through semi-structured interviews, personal observations and review of documentary evidence. The chapter also presents the impact of the project challenges and the mitigation measures employed to manage them. Moreover, a cross case analysis of the case studies was undertaken using the TBL framework, and it was reported that all three PPP market projects used as case study performed badly in terms of the People and the Profit aspects of the framework while they all recorded good performance in the area of the environment/planet.

CHAPTER 9
FRAMEWORK DEVELOPMENT, VALIDATION AND EVALUATION

"Third-party testing is a validation of the process".

Brian Hall (2003)

9.1 Introduction

The study seeks to develop a risk management framework suitable for stakeholders, especially investors in PPP market development; with a view that when inherent risks are adequately managed in a market, infrastructural facilities could be developed successfully to promote economic growth and national development. In line with this goal, five specific objectives were set. In chapters 7 and 8, findings on the first four objectives of the study have been presented. This chapter presents the proposed risk management framework in line with the fifth objective of the study: to formulate a risk management framework suitable for use by investors in PPP market development in Nigeria.

Framework/model validation and evaluation are essential parts of a framework development process, if the framework is to be accepted and used to support decision making (Macal, 2005). In addition, Macal (2005) asserts that, one of the very first questions a person promoting a framework is likely to encounter is whether the framework has been validated. In order to answer this and some other pertinent questions (e.g., "has the framework been validated?", "to what extent does the framework represents the problem entity?"), this section describes the procedures followed in validating the framework and also presents the results of the framework evaluation.

9.2 Framework Development

In developing a framework for managing risks in privately financed market projects in Nigeria, the study made use of the quantitative and qualitative results presented in previous chapters and integrated these results with theoretical analysis. For instance, chapter 7 contains the results of a survey conducted of key stakeholders in PPP projects in the southwest zone of Nigeria. The results indicated the PPP models commonly used for developing markets in Nigeria, the perceived benefits of PPP and the various levels

of understanding by PPP practitioners on the concept of risk management in general. Risk factors that affect the performance of these market projects were identified and their impacts on project success were evaluated. The results also revealed the allocation preferences of the key stakeholders to these risk factors between parties to the contract, i.e. between the public and private sectors.

In addition, from the results of the three case studies presented in chapter 8, the nature and the structure of the relationships between parties to these PPP contracts were identified and risk factors that impact on the projects were discussed. It was established that although these case studies were able to achieve the goal of redeveloping the markets to modern day shopping facilities, the projects failed to perform very well in terms of the three bottom lines: profit, people and planet. The poor performances have left the key stakeholders dissatisfied with the project outcomes.

Drawing on the theoretical analysis and the findings from these two research strands, a framework was developed comprising of three component parts. The first part presents the systematic processes involved in PPP market projects. This part of the framework was developed by combining the knowledge gained from the case studies on how these concession contracts were formed and theoretical analysis of the process involved in a typical solicited PPP project (not necessarily a market project). The first component of the framework establishes the position and place of risk management and also identifies who is responsible for the actual risk management exercise at each and every stage in the whole life cycle of a PPP market project. Risk management is presented as a continuous exercise throughout the whole life cycle of a project. The second component of the framework presents the actual iterative risk management process. This component shows how parties to a solicited PPP market project should interact towards managing risk in any PPP market project, in an iterative system characterised by persistent monitoring and review and periodic communication between parties. This second component was a product of theoretical analysis on the concept of risk management since there are no known systematic approaches for carrying out this important task on any PPP project in Nigeria. The third component of the framework provides a comprehensive list of the various tools and techniques for risk identification and analysis that prospective parties to a PPP project can choose from. Furthermore, this third component also presents the list of the 16 risk components with their respective risk factors as extracted using principal component analysis (PCA) from the study.

Finally, effective mitigation measures for these risk factors were also presented from the results obtained from both quantitative and qualitative analysis. These three components are described in the following paragraphs.

9.2.1 Framework showing systematic processes involved in PPP market projects.

This is the first section/part of the framework (see figure 9.1 for the framework). As earlier discussed, the framework shows the activities or processes involved in a typical solicited PPP market project in Nigeria from the inception of the project through to asset transfer stage. In other words, it shows the process involved in a solicited PPP market project across the whole life cycle of the project. The process has been divided into four phases: (i) Strategic and feasibility phase; (ii) Procurement phase; (iii) Construction phase; and, (iv) Operation phase.

Strategic and Feasibility phase:

As shown in the framework, the public sector client is responsible for the full range of activities involved at this stage. However, the client is likely to require external technical, legal and financial advice for these activities. The first activity is the identification of the need for beneficial change. For instance, in the case of a market project, the need may be to develop a market to boost the economic strength of a particular locality within a federal, state or local government area; or, to redevelop an existing market into a modern market suitable for the present day retail activities within the locality. Whatever the reasons for change, when a need is identified, the next step is a systematic appraisal of possible solutions to the identified need which might lead to several projects. There is always a need to assess selected individual projects using economic, social and environmental cost benefit analysis and a times use the environmental impact of the project to select which project to pursue. Value for money (VfM) and affordability testing of different procurement options is then carried out on the selected individual project. If the project is considered suitable as a PPP project, the public sector partner continues with the project as a PPP project. If not, another public procurement approach is employed or the project is brought to a stop. For a PPP project the next step is the assignment of a PPP project management team to prepare the pre-feasibility study.

At this point in the life cycle of the project, the public sector client needs to assess risks at a strategic level. At this level, assessment is made of risks that could affect the

proposed project plan in the long term, e.g. the survival, continuity and project performance. At the same time, the client needs to identify the risks of undertaking the project. This is what happens at the strategic risk study stage in the framework. The strategic risk study will analyse the project risks and mitigation measures and present a strategic description of the proposed risk allocation and contract terms. The study will equally set limits for upward reporting of risk, parameters for quantifying risk and the preferred allocation of risk among stakeholders. The next step is the establishment of a risk profile, allocation and management plan. This phase of the project will end with the preparation and approval of Outline Business Case (OBC).

Procurement Phase:

Having secured the approval of the OBC and the decision having been made to proceed with the PPP project, the next stage is the procurement phase. This phase is in two stages: (i) prequalification stage; and, (ii) negotiation and tendering. The procurement phase starts with the creation of a project team and development of a management structure. This is followed by the preparation of information memoranda and bid documentation. A project information memorandum provides bidders with the background and objectives of the project. The first draft of bid documentation may include the Concession Agreement, Expression of Interest (EOI) and Request for Qualification (RFQ). When preparing these project information documents, there may be a need for the management team to carry out market consultations. The purpose of these consultations is to ensure that the private sector has the capacity to provide the range of services required and to secure the willingness of the private sector to finance the investment.

The next stage is the advertisement of the project in the media, for example the 'Federal Tenders Board' magazine for federal projects and other media as specified in the relevant guidance. EOI and RFQ are issued, bidders shortlisted for prequalification and a request for proposal (RFP) is issued to the shortlisted bidders. This point marks the official beginning of private sector party's involvement in the PPP process. At this stage, the private sector partner conducts an initial assessment of opportunities and risks; selects partners to collaborate with and establishes lines of responsibilities and consolidates the team. At this point the private sector client estimates risks in a subjective manner and decides on possible risk mitigation measures, e.g. insure risks, transfer risks or set up a reserve account.

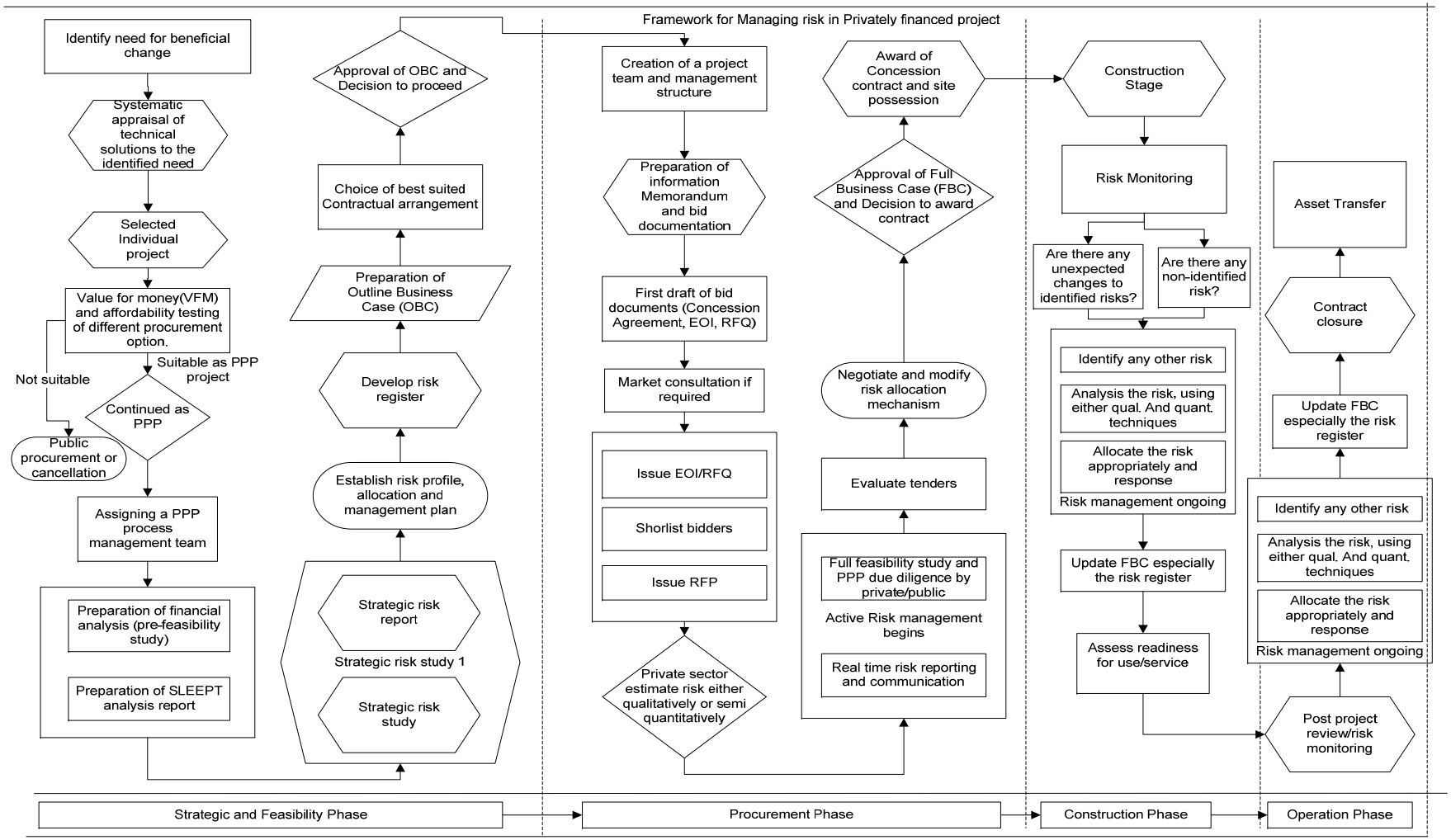

Figure 9.1 Framework for managing risk in privately financed project.

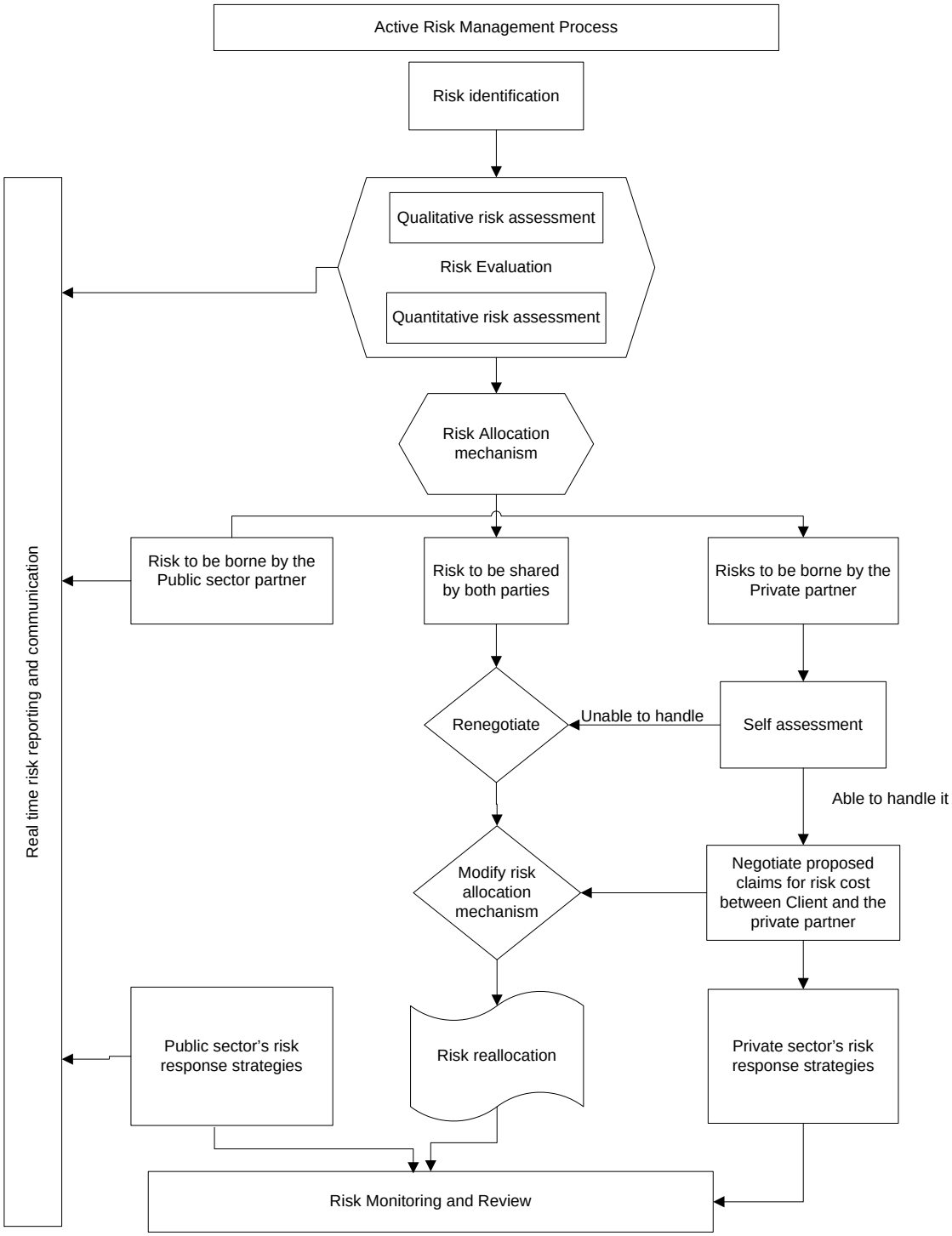

Figure 9.2 Risk Management process.

Moreover, at this stage in the procurement phase, both the public and private sector partners begin an active risk management process (see figure 9.2 for the actual iterative risk management process). This involves a full range qualitative and quantitative risk assessment and development of a risk allocation mechanism. The mechanism spells out risk to be allocated to the public partner and those to be allocated to the private partners and those to be shared by both parties to the contract. The private partner is responsible

for a self assessment exercise to assess their capability to handle risks allocated to them. The proposed claims for risk cost for those risks to be borne by the private partner are then negotiated and those they could not bear are re-allocated. The private sector partners then form their view on the desirable risk distribution from and present their bid.

The public sector will develop a full feasibility study and through PPP due diligence, involving the use of its Public Sector Comparator (PSC) as a benchmark, will then compare the bids in a transparent and competitive manner with a clear audit trail. This will lead towards the evaluation and overall selection of a preferred bidder. The next point is the selection of a preferred bidder by the client and the commencement of negotiations with that team. In a similar study in the UK by Akintoye, *et. al.,* (2001), it was suggested that at this level consultants should be heavily utilised by the client. According to them, the financial consultants should check the effect of each proposal on the payment mechanisms, to ensure that affordability for the client or the end users is not undermined. Also, consultants should make sure that the respective solutions are sound and workable. The authors further assert that a SWOT analysis should be conducted to compare the strengths, weaknesses, opportunities and threats of the bidders, before a preferred bidder is selected. The result of this exercise and the periodic negotiations with the preferred bidder will invariably lead to modification of the risk allocation mechanism and subsequent updates of the risk register. A full business case (FBC) is then developed and approved and the concession contract awarded.

Construction Phase:

Once the contract has been awarded to the preferred bidder, the contractor moves to the site and construction work begins. The next step at this stage is successive risk reviews and monitoring to ensure compliance with the required service standards as well as to monitor the effectiveness of the risk management exercise. Risk monitoring and review at this stage involve asking pertinent key questions, such as “are risks allocated appropriately”? “Are risks under control”? “Are there any unexpected changes to identified risks”? Or “are there any non-identified risk”? At this point much of the responsibility for managing risk will be passed to the contractor who will need to manage the risks in line with the risk management processes shown in figure 9.2. There will however be a number of residual risks that concern the client body. These will include the potential for consequential risks from the construction project as well as

those residual risks allocated to the client in the early stages of the project. Real time risk reporting and communication between the parties is important at this stage. The initial risk register in the FBC is then updated and allowance/claim revised. When the project reaches practical completion, the readiness for use/service of the project is then assessed and the project moves to the next phase which is the operation phase.

Operation Phase:

Risk management responsibility is passed to the management company, which can be from the concessionaire organisation or a separate company. For example, the Special Purpose Vehicle/Company (SPV/C) could have a facilities management company on board and the operation and management of the project is carried out by this company on behalf of the private partner. The risk management in this phase takes the form of a review to assess the effectiveness of risk management so that the team can learn lessons for future projects. There may be some other operational risks that were not envisaged at the start of the project. These risks need to be identified and managed adequately using the same process as in figure 9.2 and the risk register in the FBC should be updated. This is done until contract closure and subsequent asset transfer. Risk management studies at this stage provides the basis for feedback and continuous learning and improvement. They may identify the need for performance improvements in future projects.

Finally, the third component of the framework is shown in figure 9.3. The figure presents the list of risk identification techniques, risk analysis techniques available for practitioners in PPP projects and those risk mitigation measures that were ranked to be effective by the respondents in the general survey/quantitative strand of the study. This figure coupled with the results of the PCA in chapter 7 on the 16 extracted risk components form a useful checklist for practitioners, i.e. private and public partners in PPP projects.

Risk Identification Techniques

- Personal and corporate experience (PCE)
- Safety reviews (SR)
- Intuitive insights (ITI)
- Brainstorming (BR)
- Site visits (SV)
- Organisational charts (OC)
- Flow charts (FC)
- Research, interviews and surveys (RIS)
- Consultation with experts (CWE)
- Analysis of assumptions (AA)

Risk Analysis Techniques

- Risk Probability and Impact (RPI)
- Internal Rate of Return (IRR)
- Return on Investment (ROI)
- Quality function development (QFD)
- Multi Criteria and Table methods (MCM)
- Decision Tree (DT)
- Fault Tree Analysis (FTA)
- Analytic Hierarchy Process (AHP)
- Critical Path Analysis (CPA)
- Program Evaluation and Review Technique (PERT

Effective Risk Mitigation measures

- Ensure the project complies with local development plan
- Measure and price Bills of Quantities properly during bidding stage
- Ensure the approval is sought at the right local government departments
- Obtain payment and performance bonds from local and international banks
- Maintain good relationship with local government and higher officials
- Include clauses for delays and additional payments in contract, which occur due to new rules or change in law
- Obtain all necessary approvals in timely manner to minimize chance for corrupt individual to obstruct work
- Develop a clear and appropriate plan and control schedule and cost
- Undertake pre-project planning to minimize design errors
- Provide dispute settlement clauses in the contract
- Develop contingency plans and obtain insurance for expropriation
- Insist on having trustworthy people on key places within the JV
- Conduct market study and obtain exact information of competitive projects
- Adopt Design & Build option which enables contractor to design in harmony with site conditions thus minimizing design/drawing dispute
- Insure all of the insurable force majeure risks
- Offer training to new and existing staff
- Establish JV with local partners especially the central local government agencies or state owned enterprise
- Obtain insurance for political risks
- Enter into fixed rate loan contract with lending banks
- Get Design liability insurance
- Try to work directly with the business connections, i.e. do not hire broker or middleman
- Secure standby cash flow in advance
- Pay careful attention to contract translation
- Only take over the local partner's competent staff when merging with the partner or during the contract process
- Obtain local government guarantee to adjust tariff or extend concession period
- Employ reputable third party consultant to forecast market demand
- Develop own contingency for possible political instability, such as plan for emergency evacuation
- Adopt as much as possible domestic product/labour to reduce cost

Figure 9.3: List of identified risk identification and analysis techniques with effective mitigation measures.

9.3 Framework Validation and Evaluation

Framework validation and evaluation are complementary in nature and are both required to prove the reliability and validity of a given risk management framework. Validation is carried out in a conceptual framework development to ensure the framework is structured correctly and the specifications of the framework are clear, complete and that mistakes have not been made in implementing the model. Furthermore, framework validation ensures that the framework/model meets its intended requirements in terms of the methods employed and the results obtained. There is no formalised guide or procedure for selecting the approach to adopt in validating a framework as each modelling task presents a unique set of challenges and one has to figure out the best approach to test the model (Sargent, 2005).

However, Yahaya (2008) presents a model validation process comprising of the following four steps: (i) the conceptual model; (ii) computerised model; (iii) operational model; and (iv) validity of the data used to develop the model and the data used to validate the model. The first step in the model validation process, i.e. the steps relating to the conceptual model entails assessing the degree to which the model representation of the problem entity is sufficiently reasonable. The second step relates to the computerised view of the model. This relates to validation of the degree of correctness of the computerised model as a representation of the conceptual model. The third step includes 'operational validation', which is employed to determine whether or not the model's output behaviour is sufficiently accurate for its intended purpose. The last step is the assessment of the validity of the data used to develop the model, and the data used for validation.

It should be mentioned here that the validation exercise reported in this section involves only the first step of model validation process, i.e., conceptual framework validation. The reason for this is that the study does not include any computerised model and the operational validation could not be carried out due to lengthy negotiation and concession period of PPP projects and the fact that data validation aspects have already been discussed extensively in chapters 6, 7 and 8 of the thesis.

From all the aforementioned background information, and going by Hall's (2003) quote presented at the beginning of this chapter, and the suggestion of Martis (2006) it is evident that validation cannot be carried out by the researcher alone; rather, it should be

done in communication with the user. In order to verify and validate the framework, the first step taken was to identify potential end users of the framework with whom the validation could be carried out. The following groups were the key stakeholders identified as potential users of the framework at the federal level: (i) officials of the Bureau for Public Procurement (BPP); and, (ii) officials of ICRC. At State and Local government levels, the key stakeholders identified were: (i) officials of State Ministries, Departments, and local government staff as public sector clients; (ii) Private sector partners such as banks, finance houses, property developers etc.; (iii) academia; (iv) consultants; and, (v) contractors.

The second step was to decide how to go about the validation and evaluation exercise. The objective of conceptual model validation is to ensure that the model adequately captures or meets its intended objectives (Chew and Sullivan, 2000). Sargent (2005) and Martis (2006) added following to the objectives: appropriateness of the structure, logic and causal relationships that exist in the framework; effectiveness; pragmatism; and, clarity of the proposed framework. Therefore, a combination of '*face validity approach*' and '*scoring model approach*' was adopted in this study for the validation and evaluation of the framework. These two approaches aimed at capturing subjective and objective measures of validity respectively and to date are the primary validation techniques used in model concept validation (Sargent, 2005). The step by step details of how these two approaches were employed and the results of the framework evaluation are presented in the following paragraphs.

9.3.1 Face validity approach

Under face validity approach, as soon as the framework was approved by the supervisors, the framework was sent by email to identified potential users who were contacted during the fieldwork and had agreed to help during the validation and evaluation stages of the framework. In all, the framework was sent to twenty potential end users (four each from the five categories of end users identified above). Out of these thirteen responses were found to be fit for analysis. The reason for this is that some of the respondents do not complete the questionnaire very well, while some partly completed the instrument. All the respondents agreed that the structure of the framework is consistent with the processes involved in PPP arrangement and risk management. Moreover, they all agreed that the framework has the potential to improve the performance of PPP projects having provided a useful step by step procedure to

follow and tools and techniques for practitioners to carry out risk identification and analysis.

9.3.2 Scoring model approach

An evaluation instrument was sent with the framework to the identified respondents via email (see appendix S for a copy of the evaluation instrument). The respondents were asked to rate the framework based on some assessment statements like; the logical structure of the framework, the clarity of the framework, comprehensiveness of the framework etc. Furthermore, respondents were given the opportunity to further comment on the framework and identify potential weaknesses or shortcomings of the framework. Table 9.1shows the summary of the background information about the respondents. It is observable from the table that all the five identified potential users of the framework were adequately represented. For instance, 15.4 % of the respondents are from the public sector, private sector and consulting firms respectively, 31% of the respondents are from the contracting firms while 23.1% came from the academic.

Also, it is evident from table 9.1 that the minimum academic qualification of the respondents is a master degree. 61.5% of the respondents have Masters Degree while 38.5% have a PhD in their various fields of study. Moreover, 30.8% and 69.2% of the respondents are fellow members and corporate members of their respective professional bodies respectively. In addition, the respondents have an average of about 20.04 years experience in the construction industry and have also participated in about 6 PPP projects in recent years. Based on the foregoing background information about the respondents, it can be concluded that the evaluation provided by the respondents can be relied upon as a true and a reasonable assessment of the framework.

Having established the reliability of the assessment of the framework as provided by the respondents, the following sections present the assessment of the framework using specific dimensions such as the framework logical structure, clarity, comprehensiveness and applicability of the framework in construction project management. The respondents were asked to score the framework based on the aforementioned dimensions using a five-point scale where 1 represents ‘extremely poor’, 2 represents ‘below average’, 3 represents ‘average’, 4 represents ‘above average’ and 5 represents ‘excellent’ (see appendix S). Table 9.2 and figure 9.4 shows the overall mean scores of the framework against the assessment criteria. It is observable from figure 9.4 that the

respondents score the framework in terms of its logical structure, as being above average with a mean score of 4.08. Under logical structure of the framework, we sought to assess the consistency of the framework with the characteristics of the real system. In other words, we sought to know whether the framework is logically disjointed or is incoherent with the real life situation.

Table 9.1: Background information about respondents

Category	Classification	Frequency	Percentage (%)
Type of organisation	Consulting	2	15.4
	Contracting	4	30.8
	Banking	2	15.4
	Concessionaire	2	15.4
	Academia	3	23.1
	Total	13	100.0
Academic qualification	M.Tech	8	61.5
	PhD	5	38.5
	Total	13	100.0
Professional qualification	Corporate member	9	69.2
	Fellow member	4	30.8
	Total	13	100.0
Construction Experience (in Years)	11-20 years	8	61.5
	21-30 years	3	23.1
	>30 years	2	15.4
	Mean 20.04		
Number of PPP projects they have handled in the last 5 years.	1-5	7	53.8
	6-10	5	38.5
	11-20	1	7.7
	Total	13	100.0
	Mean 5.88		

In the same vein, the clarity of the framework was examined. Martis (2006) suggests clarity is a measure of intelligibility of the framework, i.e. is the frameworks clear enough to be easily understood by users? From figure 9.4, it is obvious that clarity of the framework has the highest mean score of 4.38 among the five dimensions used in

evaluating the framework. Going by this mean score, i.e. MS 4.38 which represents a scoring of above average, it implies that the framework can be said to be clear and easily understood by respondents. Moreover, comprehensiveness of the framework was also assessed. This dimension measures the degree of completeness of the framework, i.e. is the framework complete, does it include everything that is necessary in it or is something missing that ought to have been included. This measure has a mean score of 4.08 as shown in figure 9.4. In addition, it is evident from figure 9.5 that over 80% of the respondent's score the framework above average in terms of its comprehensiveness. 23.1% actually score it as excellent while 61.5% score it above average. Although, 15.4% score the framework as average, but these respondents could not specify what needs to be added. It can then be concluded that the framework is comprehensive enough for managing risk in privately financed market project.

Table 9.2: Framework Assessment

	Score					**Mean**
Dimensions	**5**	**4**	**3**	**2**	**1**	**Score**
Logical Structure of the Framework	3	8	2	0	0	**4.08**
Clarity of the framework	5	8	0	0	0	**4.38**
Comprehensiveness of the framework	3	8	2	0	0	**4.08**
Practical relevance to risk management concept in PPP project	4	9	0	0	0	**4.31**
Applicability in Construction Project management	3	6	4	0	0	**3.92**

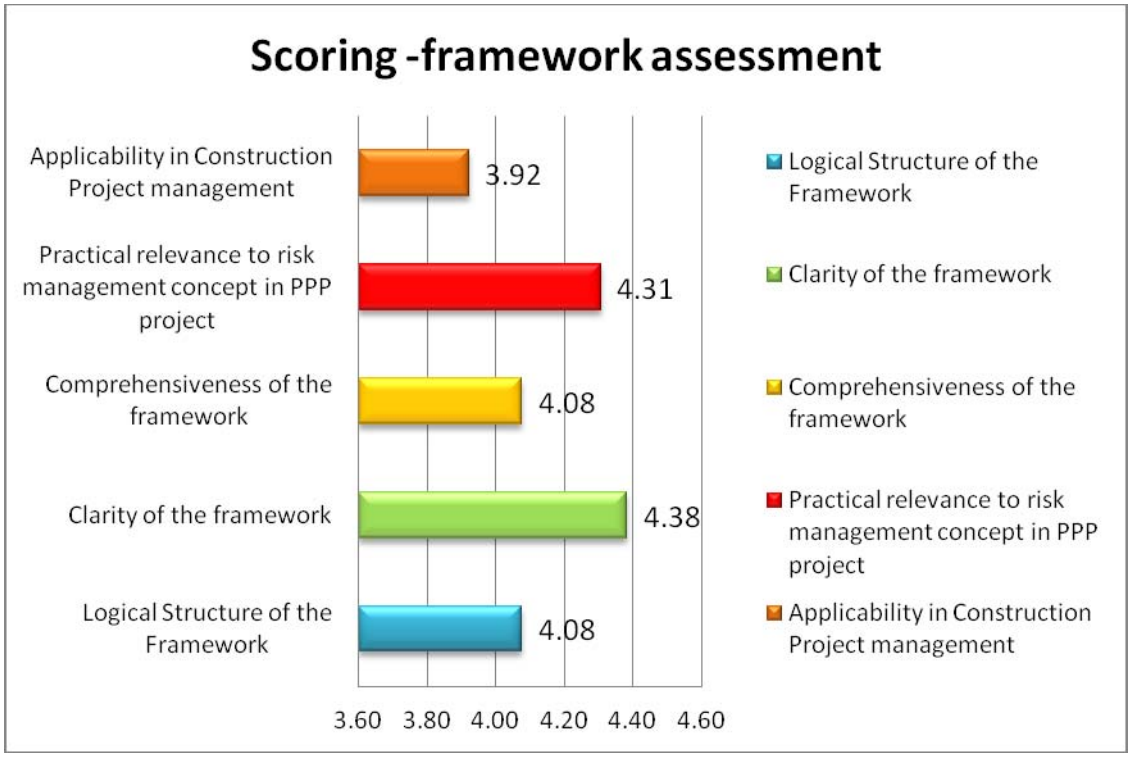

Figure 9.4 Overall Framework assessments

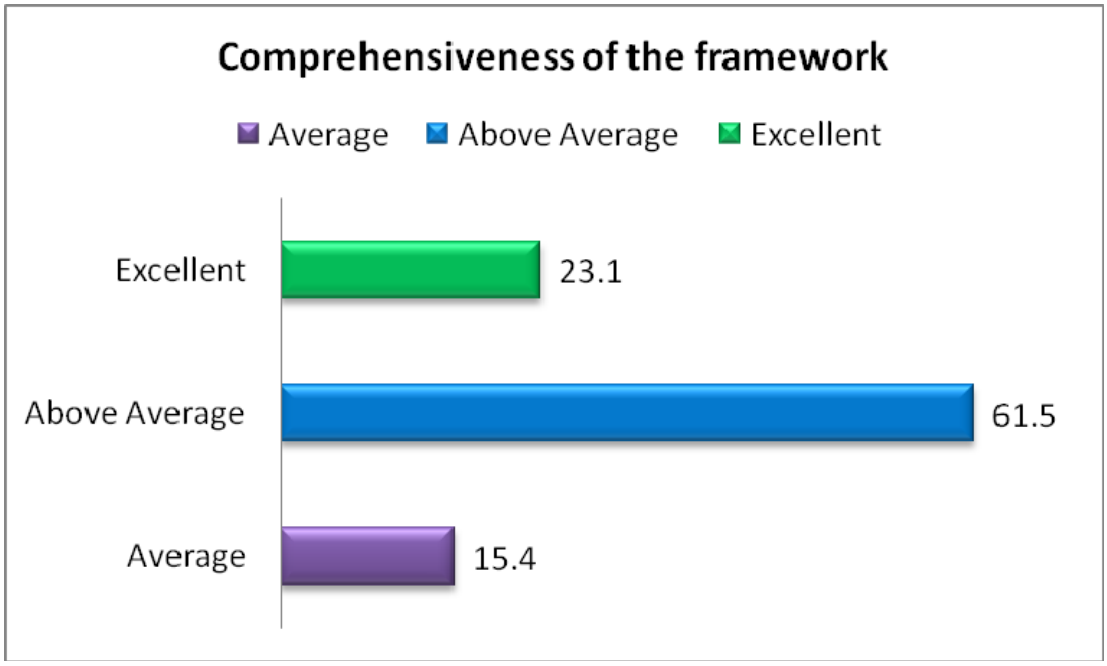

Figure 9.5 Assessing comprehensiveness of the Framework

Furthermore, applicability of the framework in construction project management and practical relevance of the framework for risk management in PPP arrangement have a mean score of 3.92 and 4.31 respectively. These scores are further reinforced with other general qualitative responses/comments from the respondents such as: (1) from an expert in the area of PPP and risk management;

"*The framework looks fantastic. I can't fault it – very thorough and rigorous, my colleague Professor Michael Regan would be very interested in this piece of work*", (Prof. Peter Love).

A cost expert, academia and consultant has this to say:

"This is a thorough framework for managing risks in PPP projects. It can be used in different projects because it covers all risk management techniques - risk identification, quantification, analysis, management, control, reporting and communication among others. In addition to the fact that it utilises all risk control mechanisms, the framework also presents PPP construction processes from inception to asset transfer. Along the construction process, key risk areas are identified and the management processes are suggested. Emphasises were placed on risk register, risk reduction meetings, risk strategic study and report as well as early warning by the stakeholders. Emphasises is also placed on risk allocation among different stakeholders"(Dr. A.S Oyegoke).

In addition, an official from the Bureau of Public Procurement, a government establishment responsible for setting standards, monitoring and controlling public procurement said;

*"This is a useful guide for risk management, it offers better value in the identification, mitigation, response, allocation, communication, etc. of risks"(*Engr. Adebowale O.*)*

Moreover, some other comments on possible problems that can be faced in the implementation of the framework as identified by the respondents are as follows:

(i). Political will of Public Sector partner to follow the risk process.

(ii). Clear understanding of participant as to need for risk management in PPP

(iii). Low literacy of PPP processes amongst investors, professionals and public sector organisations

(iv). Political interference in PPP processes in developing economies.

All these equally attest to the problem of lack of adequate knowledge and experience in risk management in the country.

From these selected responses, it can be concluded that the framework is relevant and will be very useful in risk management exercises under PPP arrangements and users are happy to use the framework in their future projects.

However, as Macal (2005) opines no framework will ever be fully validated-guaranteeing 100% error–free implementation. Some of the experts that evaluated the framework, for example, Dr. Ahmed and Dr. Ibrahim, suggested further assessment of

the framework by potential users in a workshop setting to assess the logic and relevance of framework components. Although the results from the face validity and scoring approaches employed in the study yielded positive answers confirming the usefulness, completeness and clarity of the framework in managing risks in privately financed projects, it is intended that the framework will be presented at workshops targeted at key stakeholders in a PPP arrangement in the country. This will afford the opportunity of using any of the case studies to illustrate the implementation of the framework. Furthermore, since projects vary in term of scope, complexity as well as parties involved, the application of the framework under different circumstances will also be discussed during the planned workshops.

9.4 Chapter Summary

The proposed framework for managing risk in privately financed market projects in Nigeria has been presented in this chapter. The different component parts of the framework were described. The results of a verification and validation exercise of the framework were also presented. The verification and validation were done using two main approaches, i.e. the face validity approach and scoring model approach. The views of the respondents on the logical structure of the framework, the comprehensiveness, clarity and relevance of the framework in managing risks in privately financed projects were also presented in the chapter. In addition, other comments made by respondents on the framework in terms of its strength and weaknesses were discussed in the chapter. Moreover, a mention was made of the need for further presentations of the framework to larger audiences at workshops and seminars which will be targeted at the key stakeholders in a PPP project to enable further development of this work and ensure its usefulness.

CHAPTER 10

SUMMARY OF FINDINGS, RECOMMENDATIONS AND CONCLUSIONS

"*Reasoning draws a conclusion, but does not make the conclusion certain, unless the mind discovers it by the path of experience. For if any man who never saw fire proved by satisfactory arguments that fire burns. His hearer's mind would never be satisfied, nor would he avoid the fire until he put his hand in it that he might learn by experiment what argument taught"*
Roger Bacon.

10.1 Introduction

This thesis has explored the various aspects of risk management in market development using public private partnership arrangements in south-western Nigeria. Literature was reviewed on the construction industry, PPP and risk management in the global context, and Nigeria in particular. The literature review helped in getting a general understanding of the importance of the industry in the development of a nation, specifically in the developing world. It also played a significant role in the development of the research instruments used in the research. The focus of the study is on market development which is an aspect of retail, a sector that has been described as contributing significantly to the national economy in Nigeria. In view of this, aside from a general survey of the industry, data were collected and analysed as presented in chapter 8 on three markets developed using PPP arrangements.

Risk factors affecting project performance have been assessed from the perspectives of key stakeholders. Risk management practices of stakeholders in these projects were established and the mitigation measures employed in managing risks were explored. On the basis of the findings that emerged, a framework for the risk management of PPP projects has been developed. This chapter therefore summarises the findings from the analysis carried out in the previous chapters. Appropriate recommendations are also proposed to address the findings where necessary. The chapter concludes with possible areas for further research in the area of risk management, especially in projects developed using PPP arrangements. This work will contribute to the improved performance of such projects and the overall performance of the construction industry in Nigeria, as well as in other developing countries.

10.2 Aim and Objectives of the Research

As earlier mentioned in chapter one of this thesis, this study has sought to answer a pertinent question i.e. ***"****How can we manage the inherent risk factors associated with PPP projects in a developing nation, so that markets a much needed infrastructural facilities can be developed to promote economic growth and national development?"* Therefore, driven by the five main objectives which are to:

- develop a framework for identifying, categorising and representing the risks associated with PPP projects in Nigeria;
- identify and evaluate the critical risks to various stakeholders in PPP projects, with emphasis on market development in Nigeria.,evaluate the impact of these risk factors on stakeholder satisfaction with the market projects,
- identify and evaluate the practical measures for mitigating these risks,
- formulate a risk management framework suitable for use by investors in PPP market development in Nigeria.

Through a review of the extant literature, the study first mapped out the state of the art on risk management in PPP projects generally placing special emphasis on BOT market projects in Nigeria. The intent of this was to identify current efforts in this direction and identify gap in the body of knowledge which the study will fill so as to push back the frontier of ignorance in the area of management of PPP market projects particularly in Nigeria and in other developing countries in general. After a thorough review of literature coupled with experience of the researcher in the construction industry in Nigeria as a cost expert as well as an academia, both quantitative and qualitative data were collected and analysed through surveys and in-depth interviews as well as personal interviews with key stakeholders on three markets development using BOT model of PPP as presented in the previous chapters (see chapters 7 and 8 of the thesis).

10.3 Summary of Findings

Major findings emerging from this research efforts therefore would then be summarized under two main broad headings as follows: (i) those emerging from the review of extant literature as well as other background information about the respondents and their respective organisations, and (ii) based on the systematic procedures followed in the conduct of the research and the specific objectives of the study.

10.3.1 Research findings emerging from extant literature reviewed and background information about the respondents and their organisation

Following are the findings emerging from the review of extant literature and background information about the respondents and their respective organisation:

- Markets continue to dominate both the urban and rural scenes and persist as vital components of the wholesale and retail structure in Nigeria. However, the required infrastructures to support this important sector of the economy are in short supply. The few that are available especially the central/main markets in the country are in a state of disrepair needing serious improvement or re-building in order to be able to function as efficient, clean and viable socio-economic institutions. Therefore, the need to improve the existing facilities as well as develop new ones for socio-economic development explain the recent embrace of PPP arrangements in market development; most especially when governments which have been responsible for market development can no longer single-handedly finance these projects due to shortage of funds.
- Private sector involvement in infrastructure development is not new in Nigeria, but the use of PPP arrangements in developing markets is very recent in the country. As a result of this, there is lack of understanding of PPP and risk management concepts among construction industry practitioners in the Nigeria. Many organisations, e.g. banks and finance houses, adopt a minimalist approach, doing only what is necessary to meet the mandatory requirements in PPP arrangements. A majority of construction professionals who are consultants in the industry do not have adequate knowledge of risk management processes. This is evident from their lack of knowledge of some simple risk identification and analysis tools and techniques (tables 7.4 and 7.5 referred).
- A risk management culture is completely absent within the public sector who are expected to first generate a list of potential risk events on a PPP project. Moreover, the situation is the same among the practitioners in the industry in the South-western part of the country who are advisers to both the public and private sectors. It was established by this research that there are no formalised approaches for managing risks to projects within these organisations. This is evident from the fact they have not prepared any risk registers nor produced any risk checklists during

their involvement in PPP projects. There are no specific units within these organisations responsible for risk management.

- Joint Venture (JV) and Build Operate and Transfer (BOT) are the common PPP models in use in Nigeria for market development (see section 7.4.1 of the thesis). This supports the findings of Yusuf (2005); Ayeni (2005) and Dada *et al..,* (2006).
- The perceived benefits of cooperation between the public and private sectors in the development of infrastructure are overall construction performance, getting value for money, faster implementation of projects, improved level of service and enhanced facility maintenance and overall economic development. However, in the context of PPP markets, these benefits seem largely elusive due to the short history and lack of PPP experience and expertise in the country. This is evident from the performance of the three PPP market projects used as case studies in this research.
- In addition, as a result of the short history and lack of PPP experience and expertise in the country, markets developed using PPP arrangements in Nigeria, like many other PPP projects, have been beset by many risk factors which have affected their performance especially in the area of stakeholders' satisfaction with project outcomes. This finding reinforces the assertion of Ogunlana (1997) and Abdul-Aziz (2001) that the failure of some privatized projects in Thailand - a comparable nation like Nigeria - was due to the short history and lack of PPP experience and expertise in the country.

10.3.2 Identifying, categorising and representing the risks associated with PPP projects in Nigeria

- In order to identify, categorise and represent risks associated with PPP projects in Nigeria, quantitative and qualitative data were collected. Using Ibrahim *et al..*, (2006) exogenous and endogenous risk factors classifications as spring board, the data analyses, data using both descriptive and inferential statistics as reported in Chapter 7, revealed the following:
- In terms of the likelihood of occurrence and consequences of risk factors on PPP market projects of risk factors on PPP projects, the top 10 exogenous risk factors with high probability of occurrence are: unstable government; corruption and lack of respect for law; strong political opposition, non-involvement of host community; inconsistencies in government policies; inflation rate volatility; import/export restrictions; exchange rate fluctuation; poor public decision making process and

legislation change/inconsistencies. While Lack of commitment from public/private partner; construction time overrun; construction cost overrun; inadequate experience in PPP; availability of finance; high finance cost; excessive contract variation; low operating productivity; poor quality of workmanship and maintenance cost higher than expected were among the top ten (10) internal risk events that were likely to occur on any PPP projects. All these identified risk factors were said to have impact on PPP projects in case of their occurrence.

- In term of risk categorisation,, principal component analysis revealed 16 principal component factors and 68 associated risk variables which are represented by: Environmental and Cultural risk, Economic risk, Public Opposition, Political risk, Lack of Tradition of Private Provision of Public Services, Bureaucracy risk, Nationalisation of Assets, Insolvency of Partners, Competition risk, Faulty Contract Documentation, Return on Investment, Financial risk, Wrong Estimation due to inexperience of the PPP model, Multi-party risk, Organisational risk and immature juristic system, and Maintenance risk (see tables 7.29 and 7.30)

10.3.3 Identify and evaluate the critical risks to various stakeholders in PPP projects, with emphasis on market development in Nigeria

- Having identified and categorised risk factors in PPP projects, the criticality of each risk factor were assessed using criticality index scores (see section 7.7 for the discussion on this). The respondents were also asked to show their allocation preferences for these risk factors. The analysed data revealed that:
- Nine risk events out of the sixty-eight risk events identified as being significant to PPP projects in Nigeria were allocated to the public sector as follows: (i) Industrial regulation change, (ii) Unstable government, (iii) Inconsistencies in government policies, (iv) Legislation change/inconsistencies, (v) Change in tax regulation, (vi) Import/Export restrictions, (vii) Delay in project approvals and permits, (viii) Land acquisition/site availability and (ix) Lack of government guarantees. 33 risk factors were allocated to the private sector while 26 were to be shared between the private and public sectors. These results also corroborate previous findings of Zhang *et al..,* (1998) and Li *et al..,* (2005) in Hong Kong and the UK respectively. These studies established a greater number of risks were allocated to the private sector than the public sector partner. Moreover, it is also evident that the majority of the risks allocated to the private partner are endogenous risk factors (i.e., risk factors that are

internal to the project) whereas, greater numbers of exogenous risk factors were allocated to the public sector or shared by both parties.

10.3.4 Evaluating the impact of these risk factors on stakeholder satisfaction with the market projects

- Using the Triple Bottom Line framework (TBL), i.e. People, Profit, and Planet, it was revealed by the research that these risk factors have serious impacts on the performance of the projects. Aside from poor cost and time performance, all three of the PPP market projects used as case studies performed badly in terms of the People and the Profit aspects of the framework, leading to overall dissatisfaction with the projects among stakeholders. However, it was also revealed that all these PPP projects can be said to have recorded good performance in the area of the environment/planet.
- Moreover, the study further revealed that stakeholders were not satisfied with the outcomes of the PPP market projects. For example, investors cited the high cost of finance, too many layers of bureaucracy and low levels of demand on the project. While, end users complained of the high costs they had to pay to secure a shop in the market.

10.3.5 Identifying and evaluating the practical measures for mitigating these risks.

- The study revealed 28 effective risk mitigation measures that could be employed on any given PPP market project. The following are the ten most effective mitigation measures identified in the study, although the other mitigation measures are also effective in some contexts: (i) Ensuring that the project complies with the local development plan; (ii) Proper measurement and accurate pricing of Bills of Quantities at the bidding stage; (iii) Ensuring that approval is sought from the right local government departments; (iv) Obtaining payment and performance bonds from local and international banks; (v) Maintaining a good relationship with local government and other officials at different levels; (vi) Including clauses for delays and additional payments in the contract, which may occur due to new rules or changes in the law; (vii) Obtaining all necessary approvals in a timely manner to minimise the opportunities for corrupt individuals to obstruct work; (viii) Developing a clear and appropriate plan and controlling the schedule and cost; (ix) Undertaking pre-project planning to minimise design errors; and (x) Providing dispute settlement clauses in the contract.

- Furthermore, among the risk mitigation measures that were ranked by the respondents to be somewhat effective we have: (i) Gaining accurate financial and other information from international and independent security and risk evaluation agencies; (ii) Hiring a company's own competent native language-speaking employees, even when some of the staff understand the native language; and (iii) Establishing agreements with local government agencies to reduce/ exempt a company from import formalities.

10.3.6 Formulating a risk management framework suitable for use by investors in PPP market development in Nigeria

- The main contribution of this research therefore, is better understanding of the risk management process in privately financed (PF) MPs in Nigeria. Drawing on the theoretical analysis and the findings from quantitative and qualitative research strands, a framework was developed comprising of three component parts (see section 9.2). The first part presents the systematic processes involved in PPP market projects. This first part of the framework establishes the position and place of risk management and also identifies who is responsible for the actual risk management exercise at each and every stage in the whole life cycle of a PPP market project. Risk management is presented as a continuous exercise throughout the whole life cycle of a project. The second component of the framework presents the actual iterative risk management process. While the third component of the framework provides a comprehensive list of the various tools and techniques for risk identification and analysis that prospective parties to a PPP project can choose from. Furthermore, this third component also presents the list of the 16 risk components with their respective risk factors as extracted using principal component analysis (PCA) from the study.

10.4 Recommendations

Based on the findings of this research, the following policy recommendations are proposed that will help in ameliorating or eliminating the identified problems on future PPP market projects. These recommendations will also contribute to enhancing the performance of the construction industry in Nigeria in general.

1. There is an urgent need for the development of risk management cultures within the construction industry. Most importantly in PPP procurement options that has been

characterised to be prone to too many risk. The culture must be instilled within both the public and private sector organisations as well as their consultants in the industry. The successful management of risks is usually the product of a successful organisation that has instilled into its people the importance of careful planning. Careful planning involves several core competences - the capacity to understand uncertainty and risk, to integrate risk identification and assessment techniques into programme and project planning, and to build and sustain a support system for risk management that provides essential information when it is needed.

2. In order to build a risk management culture within both the public and private sector organisations, there is a need to teach and train projects leaders and team members within these two sectors to think in terms of risk and to internalise the risk management processes into their daily work practices and procedures. This is very important as in-house expertise is necessary even when external consultants are available to offer expert advice. Therefore, short-term training in the area of PPP and risk management should be organised for officials that are involved in the procurement of public projects in both the public sector and private sectors (most notably, officials of ICRC, BPP, State Tenders Board, State Ministries and Departments of Works). In the longer-term, both government and management of private organisations should encourage and support their employees to take further study and training in the areas of risk management and procurement.
3. Due to the complexity of the PPP arrangements, both public and private sector project teams rely on external advisers and most of the well-established advisers have not gathered enough or extensive knowledge of PPP projects. Practitioner/professionals themselves should seek to improve. In line with this recommendation, the Association of Professional Bodies in Nigeria (APBN) should organise seminars, workshops and conferences on risk management, public private partnerships and other issues related to procurement studies. APBN is an umbrella body and authoritative voice for institutes, institutions and societies which are recognised and chartered to regulate the professions by the law of the Federal Republic of Nigeria in collaboration with their member bodies (e.g., NIOB for Builders, NIQS for Quantity Surveyors, NSE for Engineers, NIA for Architects, NIEVS for Estate Surveyors, CIBN for Bankers, ICAN for Accountants, and NIM for Managers). This will provide a good avenue to disseminate the findings of this research as well as an opportunity for professionals to interact and exchange ideas on issues related to risk management. In addition to this, more structured

mechanisms for proactive knowledge capturing, maintenance of good databases and the transfer of knowledge gained from previous projects will help to increase the levels of PPP expertise in the public sector.

4. It is also recommended that sufficient mechanisms should be established to ensure that governments honour agreements made with their predecessors due to frequent changes in governments. In line with this, it is advised that the implementation of an Infrastructure Concession Regulatory Commission (ICRC) be extended to the State level to assure the investor community of the legality and enforceability of concessions consummated in accordance with the ICRC Act. Furthermore, a special PPP unit should be established in other States, similar to the unit in Lagos State. This will help each State keep records of PPP projects in their state and ensure that the regulations and the standards set by the ICRC at federal level are adhered to. Such a unit will also help the state to monitor, review and evaluate the progress of these PPP projects at every phase throughout the life span of the project.
5. Since the ever-increasing use of PPP calls for training and development of relevant skills in PPP processes and risk management, it is important that tertiary institutions in Nigeria broaden their syllabus to incorporate teaching on tools and techniques for risk identification and analysis. This is necessary to improve the effectiveness of risk identification and analysis exercises. For instance, the current level of risk analysis is often shallow, which is due largely to the capabilities and the understanding of practitioners of the available tools and techniques. An expanded syllabus that incorporates other tools such as Monte Carlos simulation or decision trees, system dynamics, structural equation modelling, safety and hazard analysis, integrated logistic support (ILS) etc. would definitely be worthwhile.
6. Moreover, it was established by the study that risk events occur at every stage in the PPP life cycle. This makes it important that risk management should become fully integrated not only at the planning phase of the project but throughout all the phases of a PPP project. Moreover, the integration should be both in the management of projects and in the organisational culture. The reason for this is that it is only then that the results of risk management can be used appropriately. Effective integration of risk management in the organisational culture will also help improve the acceptability and usefulness of risk management to project teams.
7. An important reason advanced for the adoption of PPP arrangements in market development is a shortage of funds. There is a general consensus to the fact that a mature financial market will help a consortium to garner adequate funds for the

Special Purpose Vehicle (SPV) set up specifically for a PPP projects. As a result of this, it is not surprising to see insolvency of partners and financial risk among the 16 principal components identified in the study with their associated risk events. Therefore, governments should develop and embed an innovative capital market which will provide adequate finance for the SPV at a reasonable rate. High costs of finance will increase the cost the SPV will be charging for the services supplied to recover their investment.

8. Insurance companies within the country should also develop and offer the market a variety of products suitable at each stage of a PPP project — tendering, design and construction phases, operation and maintenance periods, and termination of the PPP agreement. For instance, the customary insurance package in PPP projects includes coverage of construction risks, material damage claims, and civil liability to third parties. In addition, a concessionaire often obtains insurance against business interruptions, strikes and acts of God. However, as PPP projects are highly complex and involve large sums, potentially insurers might need to pool their resources together for this purpose in the form of Joint Ventures system
9. Economic and Political risk are among the principal risk components identified in the study. For the sustained good performance of PPP market projects, governments should endeavour to maintain economic and political stability.
10. Moreover, since public opposition and a lack of tradition of private provision of public services such as markets are principal risk components that impact on the performance of PPP market project, it is recommended that public opinion should be properly managed. The mechanisms for this may include gathering and disseminating the information necessary to enlighten and educate the public as an important stakeholder in PPP projects.
11. Another way to achieve public support for a PPP project is through the timely and adequate involvement of all project stakeholders. This can only be achieved by identifying potential stakeholders, assessing their power and influences on the project and keeping them satisfied. In other words, through effective stakeholder management – the need for effective stakeholder management was clearly evident in the case studies in this study.
12. It was established by the study that there is corruption and a lack of transparency in PPP processes and procedures. It is arguable that these could be reasons for public opposition to some of the projects used as case studies. Therefore, it is recommended that government at all levels should build in transparency and

accountability in procurement processes and procedures. This is important for people to know what the government is doing, why the government is using PPP arrangements and not other procurement routes and to guard against favouritism and corruption. By so doing, Nigerians can often view PPP arrangements as odd believing that their government has simply been shying away from their responsibilities and providing the private sector with more opportunities to exploit the citizens of the country.

13. Government should also seek to create the legal environment for private investment through the establishment of appropriate legal and institutional frameworks and access to adequate and accurate information.
14. A finding emerging from the study is the necessity to understand the local cultural heritage of the people, especially in the area where the market is situated. This is very important, especially in a setting such as amongst the Yorubas who are very conscious and protective of their cultural values. This will enhance public acceptance as well as reduce cultural risk to projects.

10.5 Limitations of the Research

There are three major conditions that can be said to limit the applicability or generalisation of the findings of this research to the entire country, other developing countries or other types of PPP projects. These conditions are as follows:

(i) The data size. Quantitative and qualitative data have been used in the development of this study, including case studies (3 case studies) and quantitative data collection (93 respondents). It is hoped that the list of risks factors encountered and possible mitigation measures could be enhanced in future work if more cases are studied within the region. Furthermore, the opinions expressed by respondents could have been better understood if more data could have been obtained from a larger number of respondents who had been involved in PPP projects. This was not possible due to the newness of the PPP philosophy in the country, especially in market development and is a limitation of this study.

(ii) The PPP philosophy can be employed for the development of both social and economic infrastructures. It has been argued in the study that markets can be seen as having socio-economic characteristics, therefore, it is hoped that the list of risk factors in a purely social and purely economic project might be different from what we have

here under - market development a socio-economic infrastructure. Thus, this might be limitation in a way to the study.

(iii) Cultures differ a great deal across the six geo-political zones of Nigeria, as well as across countries of the world. The research has been conducted mainly in the south-western part of the country which is predominantly populated by the Yoruba speaking tribes. Since it is difficult to separate a market as a socio-economic institution completely from the culture of the people in the area in which the market is situated, the framework may be limited by the fact the cultures within these zones or within other countries could influence the ranking of the risk factors.

10.6 Conclusions

The Nigerian economy is growing, and this is leading to high demand for quality housing, office space and other related real estate infrastructure. There is a huge gap between supply and demand of infrastructure within the economy, especially in the retail sector. With a population of over 150 million and growing, Nigeria offers an excellent opportunity for investors to profit from the growth expected to occur in the next decade or two. The success of the telecoms industry in Nigeria, which today is the largest market in Africa, is testimony to this.

Presently, many of Nigeria's markets are being upgraded to more modern and organised infrastructures and new markets are being developed. Many state governments are launching a crackdown on illegal roadside trading and providing alternative facilities for people to trade. Due to budget constraints, governments could not afford to provide these facilities single-handedly. This has led to partnering with the private sector to construct modern markets, which incorporate other infrastructures such as car parks, water supply, standby electricity and public toilets and provide better business and trading environments. Having opened the market to private developers to fill the gap that cannot be met by the public sector through the establishment of the Infrastructure Concession Regulatory Commission (ICRC), the coast can be said to clear for the private sector to cash in on these developments.

However, much still needs to be done. The experience of previous PPP market projects in the country has not been all that encouraging. This is not to say that the adoption of PPP arrangements is a negative development, but the poor performance of these projects

has been as a result of short experience in PPP arrangements and the lack of a risk management culture within the construction industry in Nigeria.

The study has identified risks in privately financed market projects. The impacts of these risk events were identified and assessed; allocation preferences of practitioners and possible mitigation measures to these risks were also assessed within the south-western part of the country. This has led to development of a holistic risk management framework that identifies best practice in risk management, with particular emphasis on solicited market projects. The structure specifies what should be done, who should do it and when it should be done throughout the entire life cycle of any PPP market project. Other components of the framework identified lists of risk events that are capable of impacting on PPP projects, especially market projects, and provided a list of risk identification and analysis techniques available within construction industry. This could serve as a checklist for future PPP market projects in the south-western region and in Nigeria at large.

It is therefore hoped that the results of this research will provide a useful tool for rapidly learning about the risks involved in PPP market projects and for understanding viable options for the effective management of these risks. The results of the research are intended to help organisations within the construction industry to build a strong risk management culture. An organisation with a strong risk management culture has policies and procedures that require its workforce to go through disciplined risk planning, identification, assessment, and risk response project phasing. Moreover, the results of this research will serve as a baseline for public sector clients in a solicited PPP project to prepare an effective risk allocation mechanism for use in bidding documents. The identified risk allocation preferences would help both the public and private sector achieve a balanced distribution of responsibilities and risks. This will not only reduce the negotiation period but also reduce the costs incurred by both parties during negotiations.

Finally, it is sincerely hoped that if these recommendations are considered and implemented on privately financed market projects, the continued poor performance of PPP market projects can be avoided and the expected benefits of private participation in infrastructure development in Nigeria will accrue to the people.

10.7 Areas for Further Research

Some of the findings of the study provide possible directions for further research in the following areas:

1. The current study was limited to PPP projects in the retail sector of the economy. PPP arrangements are being employed in other sectors of the economy, e.g. transportation, housing, and energy sectors at both the Federal and State levels. Further research could be carried out on projects in these sectors and a comparative study undertaken across sectors. Such a study could reveal risk management practices across sectors and identify differences in the performance of these projects as well as the structure of risk across sectors.
2. The study was also limited to PPP market projects within the south-western zone of the country due to varying cultural issues in market development across regions of the country. As mentioned in the previous chapter, the south-west zone of the country is populated by predominantly Yoruba speaking tribes while in the Northern part of the country it is Hausa, and Ibo in the Eastern part of the country. More research could be done on privately financed market projects in the other five geo-political zones of the country for complete coverage of the entire country. This could result in a comprehensive risk database for PPP projects throughout Nigeria.
3. Anecdotal evidence suggests a lack of transparency in the selection of private partners in the industry. Therefore, a study aimed at developing standardised criteria for selecting private partners and providing monitoring and evaluating procedures offers great potential for ameliorating this problem.
4. The risk management framework developed in this present study is generic for a typical solicited PPP project. Further research could look at developing similar frameworks for unsolicited PPP projects, where the private sector has first identified a particular need in a given sector of the economy.

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APPENDIX

Appendix A: General Questionnaire survey

13th July, 2010

Dear Sir/Madam:

FRAMEWORK FOR RISK MANAGEMENT IN PRIVATELY FINANCED MARKET PROJECTS IN NIGERIA

The above research is investigating the key risk factors in privately financed market projects in Nigeria. The nation has recently embraced private sector participation in the provision of shopping facilities.

The research seeks to:

1. Develop a framework for identifying, categorizing and representing the risks associated with Public Private Partnership market projects in Nigeria.
2. Identify and evaluate the critical risks inherent with PPP market projects in Nigeria.
3. Evaluate the impact of these risk factors on stakeholder's satisfaction of the market projects.
4. Identify and evaluate the practical measures for mitigating these risks.
5. Formulate a risk management framework suitable for investors in PPP market development in Nigeria.

Your assistance in sparing us approximately 30minutes to share your valuable knowledge and experience by completing the attached questionnaire will be highly appreciated. Please be assured that any information given will be treated in the strictest confidence and used for research purpose only. If you desire to have the summary of our report at the end of the study, we shall be delighted to send you a copy, do indicate your email address in the background information section of the questionnaire.

Thanks in anticipation.

Yours Sincerely,

Awodele Oluwaseyi
(PhD Research Student)
Prof. Stephen Ogunlana
(Research Main Project Supervisor)
Dr. Ibrahim Motawa
(Research Co-Project Supervisor)

Survey on Risks in Privately Financed Market Projects in Nigeria

(July, 2010)

SECTION A GENERAL INFORMATION

1. Name of organization (optional)…….....

2. Type of Establishment: Consulting ☐ Contracting ☐ Banking ☐
Concessionaire ☐ Others specify…….

3. Academic Qualification: HND ☐ B.Tech/BSc ☐ M.Tech ☐ PhD ☐

4. Profession: Quantity Surveying ☐ Architecture ☐ Engineering ☐
Building ☐ Others (specify)……..

5. Years in Service: 1-5 ☐ 6-10 ☐ 11-20 ☐ 21-30 ☐ > 30 ☐

6. Designation of Respondent in the establishment: Chief Executive/Managing Director ☐
Project Manager ☐ Financial Adviser ☐ Facilities Manager ☐ Cost Adviser ☐
Architect ☐ Engineer ☐ Others (specify) ☐

7. Professional qualification:	NIQS	COREN	NIA	NIOB	OTHERS
Graduate member					
Corporate member					
Fellow member					

8. Have you been involved in any project executed under public-private partnership arrangement?
Yes ☐ No ☐

9. If 'Yes', how many? 1-5 ☐ 6-10 ☐ 11-15 ☐ 16-20 ☐ 21-25 ☐ > 26 ☐

10. Type of project: (please tick one in which you have been involved and for which your answers to this questionnaire apply)

Schools ☐ Housing ☐ Health ☐ Prisons ☐ Roads ☐ Airports ☐ Rails ☐

Markets ☐ Telecommunication ☐ Others (please specify)……

11. Project Name:……

Please (tick) as appropriate:

12. Your role is: Government ☐ Sponsor ☐ Contractor ☐ Consultant ☐

13. Investment party/parties: Government ☐ Sponsor ☐ Contractor ☐
Lenders ☐

14. Project cost (million Naira): ≤250 ☐ 251-500 ☐ 501-750 ☐ 751-1000 ☐ >1000 ☐

15. Sponsor's equity (%): ≤ 15 ☐ 16-30 ☐ 31-45 ☐ 46-60 ☐ 61-75 ☐ >75 ☐

16. Government's equity (%):≤ 15 ☐ 16-30 ☐ 31-45 ☐ 46-60 ☐ 61-75 ☐ >75 ☐

17. Name and Address for correspondence (optional):…….....

……..

.....……

…….....

18. In the PPP market projects handled so far, kindly indicate the frequency of employing the following PPP models using the scale below

Highly frequent	Frequent	Slightly frequent	Not frequent	Not applied
5	4	3	2	1

PPP Models	RATING				
	5	4	3	2	1
Build Transfer					
Design Build Maintain					
Build Transfer Operate					
Build Own Operate Transfer					
Build Own Operate					
Build Lease Transfer					
Contract Add and Operate					
Develop Operate Transfer					
Rehabilitate Own Operate					
Rehabilitate Operate Lease					
Rehabilitate Operate Transfer					
Lease					
Alliancing					
Bundling					
Competitive partnership					
Turnkey					
Joint Venture					
Integrator					

19. Kindly assess the perceived benefits of private sector participation in infrastructure development based on your experience so far in the Nigerian Construction Industry .Using the scale below.

Excellent	Good	Average	Fair	Poor
5	4	3	2	1

Perceived benefits of PPP	RATING				
	5	4	3	2	1
Construction performance					
Delivering to time					
Value for money					
Delivering to budget					
Operational performance(Proper functioning& fund management during operation)					
Innovation and spread of best practice					
Development of new business sector/Enhanced economic development					
Risk sharing					
Improved level of service enhanced facility maintenance					
Faster implementation(Government is dealing with only one single party)					

SECTION B IDENTIFICATION AND CATEGORISATION OF RISKS IN PPP PROJECTS

Please (tick) as appropriate

20. In your own opinion, the burden of risk identification in PPP projects should lies with which of the parties (a) The public sector/Client ☐ (b) The private sector ☐ (c) Both parties ☐

21. In developing a client's risk matrix in PPP market project, kindly tick (√) to indicate the method you are familiar with out of the following methods.

Method in use	Indication of knowledge about it
Personal and corporate experience	
Safety reviews	
Intuitive insights	
Brainstorming	
Site visits	
Organizational charts	
Flow charts	
Research, interviews and surveys	
Consultation with experts	
Analysis of assumptions	

22. In the market project you have handled, do you have a risk checklist or client's risk matrix produced?(a) Yes ☐ (b) No ☐

23. Please tick (√) to identify the tool/techniques used in analyzing those risks you identified.

Method in use	Indication of knowledge about it
Risk probability and impact	
Internal rate of return (IRR)	
Return of investment (ROI)	
Quality function development (QFD)	
Multi criteria & table methods	
Decision tree	
Fault tree analysis	
Analytic hierarchy process (AHP)	
Critical path analysis (CPA)	
Program evaluation & review technique (PERT)	

ASSESSMENT OF PROBABILITY OF OCCURRENCE OF RISK, THEIR POTENTITAL CONSEQUENCES AND RISK ALLOCATION PREFERENCES.

Identified risks from literature have been classified under two main categories:

1) Endogenous risks.
2) Exogenous risks.

* Endogenous: risk events and consequences which occur within the system boundaries of the project being considered, and includes risks occurring in the relationships between the stakeholders due to the inherent differences between the working practice and strategies of the private and public sectors).

*Exogenous risks represent event and consequences which are external to the particular project under consideration.

24. Please tick (√) as appropriate to indicate your assessment of the probability of occurrence and criticality of the impact of identified risk using your experience in a PPP market project you have handled. The scale are as follows: Criticality of Impact;

Disastrous	Severe	Substantial	Marginal	Negligible
5	4	3	2	1

Disastrous = project investment could not be sustained, Severe = serious threat to project objectives, Substantial = reduces attainment of project objectives significantly, Marginal = small effect on project objectives, and Negligible= trivial effect on project objectives.

25, Likelihood/probability of occurrence;

Very likely	likely	Somehow likely	Slightly likely	Not likely
5	4	3	2	1

26. Risk should be allocated to the party who can best handle or manage them, by using the scale below, please indicate how you feel the identified risk factors should allocated among parties to PPP contract.

Risk allocation preference

1	2	3
Public Partner	**Private Partner**	**To be shared by both parties**

No.	Exogenous Risk Factor	Probability					Impact				
		5	4	3	2	1	5	4	3	2	1
EX1	Unstable government										
EX2	Possible expropriation/ nationalization of assets										
EX3	Poor public decision making process										
EX4	Strong political opposition/hostility										
EX5	Inconsistencies in government policies										
EX6	Poor financial market										
EX7	Inflation rate volatility										
EX8	Interest rate volatility										
EX9	Exchange rate fluctuation										
EX10	Influential economic event(boom/recession)										
EX11	Legislation change/inconsistencies										
EX12	Change in tax regulation										
EX13	Corruption and lack of respect for law										
EX14	Import/Export restrictions										
EX15	Rate of returns restrictions										
EX16	Industrial regulation change										
EX17	Lack of tradition of private provision of public services										
EX18	Public opposition to projects										
EX19	Non-involvement of host-community										
EX20	Cultural differences between main stakeholders										
EX21	Force majeure										
EX22	Weather										
EX23	Environment										
EX24	Geotechnical conditions										

No	Endogenous Risk Factors	Probability					Impact				
		5	4	3	2	1	5	4	3	2	1
EN1	Land acquisition/site availability										
EN2	Level of demand for the project										
EN3	Prolonged negotiation period prior to initiation										
EN4	Competition risk										
EN5	Fault in tender specification										
EN6	Availability of finance										
EN7	High finance cost										
EN8	Lack of creditworthiness										
EN9	Liquidity										
EN10	Depository										
EN11	High bidding costs										
EN12	Inability to service debt										
EN13	Lack of government guarantees										
EN14	Bankruptcy of concessionaire										
EN15	Financial attraction of project to investors										
EN16	Residual value (after concession period)										
EN17	Delay in project approvals and permits										
EN18	Design deficiency										
EN19	Unproven engineering techniques										
EN20	Construction cost overrun										
EN21	Construction time overrun										
EN22	Availability of appropriate labour/material										
EN23	Manpower problem associated with trade unions										
EN24	Late design changes										

No.	Endogenous Risk Factor	Probability					Impact				
		5	4	3	2	1	5	4	3	2	1
EN25	Poor quality of workmanship										
EN26	Excessive contract variation										
EN27	Insolvency/default of subcontractors and suppliers										
EN28	Risk regarding pricing of product/service										
EN29	Operational revenue below projection										
EN30	Operation cost overrun										
EN31	Low operating productivity										
EN32	Maintenance more frequent than expected										
EN33	Maintenance cost higher than expected										
EN34	Competitive market (a product with close substitute)										
EN35	Life of facility shorter than anticipated										
EN36	Inadequate experience in PPP										
EN37	Organization and coordination risk										
EN38	Inadequate distribution of responsibilities and risks										
EN39	Lack of commitment from public / private partner										
EN40	Inadequate distribution of authority between partner										
EN41	Different working methods/know-how between partners										
EN42	Counter party's creditworthiness										
EN43	Staff crises										
EN44	Third party tort liability										

26. Please tick (√) as appropriate to indicate your opinion on who should be saddled with responsibilities of managing the identified risk factors. Using the following scale: (1) Allocate to public partner, (2) Allocate to private partner, and (3) Share by both parties

No.	Exogenous Risk Factor	Party Responsible for its Management		
		1 Public Partner	2 Private Partner	3 To be shared by both parties
EX1	Unstable government			
EX2	Possible expropriation/ nationalization of assets			
EX3	Poor public decision making process			
EX4	Strong political opposition/hostility			
EX5	Inconsistencies in government policies			
EX6	Poor financial market			
EX7	Inflation rate volatility			
EX8	Interest rate volatility			
EX9	Exchange rate fluctuation			
EX10	Influential economic event(boom/recession)			
EX11	Legislation change/inconsistencies			
EX12	Change in tax regulation			
EX13	Corruption and lack of respect for law			
EX14	Import/Export restrictions			
EX15	Rate of returns restrictions			
EX16	Industrial regulation change			
EX17	Lack of tradition of private provision of public services			
EX18	Public opposition to projects			
EX19	Non-involvement of host-community			
EX20	Cultural differences between main stakeholders			
EX21	Force majeure			
EX22	Weather			
EX23	Environment			
EX24	Geotechnical conditions			

No.	Endogenous Risk Factor	Party responsible for its management		
		1 Public Partner	2 Private Partner	3 To be shared by both parties
EN1	Land acquisition/site availability			
EN2	Level of demand for the project			
EN3	Prolonged negotiation period prior to initiation			
EN4	Competition risk			
EN5	Fault in tender specification			
EN6	Availability of finance			
EN7	High finance cost			
EN8	Lack of creditworthiness			
EN9	Liquidity			
EN10	Depository			
EN11	High bidding costs			
EN12	Inability to service debt			
EN13	Lack of government guarantees			
EN14	Bankruptcy of concessionaire			
EN15	Financial attraction of project to investors			
EN16	Residual value (after concession period)			
EN17	Delay in project approvals and permits			
EN18	Design deficiency			
EN19	Unproven engineering techniques			
EN20	Construction cost overrun			
EN21	Construction time overrun			
EN22	Availability of appropriate labour/material			
EN23	Manpower problem associated with trade unions			
EN24	Late design changes			

EN25	Poor quality of workmanship			
EN26	Excessive contract variation			
EN27	Insolvency/default of subcontractors and suppliers			
EN28	Risk regarding pricing of product/service			
EN29	Operational revenue below projection			
EN30	Operation cost overrun			
EN31	Low operating productivity			
EN32	Maintenance more frequent than expected			
EN33	Maintenance cost higher than expected			
EN34	Competitive market (a product with close substitute)			
EN35	Life of facility shorter than anticipated			
EN36	Inadequate experience in PPP			
EN37	Organization and coordination risk			
EN38	Inadequate distribution of responsibilities and risks			
EN39	Lack of commitment from public / private partner			
EN40	Inadequate distribution of authority between partner			
EN41	Different working methods/know-how between partners			
EN42	Counter party's creditworthiness			
EN43	Staff crises			
EN44	Third party tort liability			

The following are possible mitigation measures

27. Please (tick) as appropriate to indicate your assessment of the effectiveness of the identified risk mitigation measures using your experience in a PPP market project you have handled using the following scale:

Very Effective	Effective	Somehow effective	Slightly effective	Not effective
5	4	3	2	1

	Risk mitigation measure	5	4	3	2	1
1	Ensure the project complies with local development plan					
2	Maintain good relationship with local government and higher officials					
3	Obtain insurance for political risks					
4	Include clauses for delays and additional payments in contract, which occur due to new rules or change in law					
5	Ensure the approval is sought at the right local government departments					
6	Try to work directly with the business connections, i.e do not hire broker or middleman					
7	Obtain all necessary approvals in timely manner to minimize chance for corrupt individual to obstruct work					
8	Develop contingency plans and obtain insurance for expropriation					
9	Develop own contingency for possible political instability, such as plan for emergency evacuation					
10	Pay careful attention to contract translation					
11	Insist on having trustworthy people on key places within the JV					
12	Establish JV with local partners especially the central local government agencies or state owned enterprise					
13	Transfer ordinary technology only but keep the key ones					
14	Study carefully the differential taxation and find legal and reasonable measures to reduce taxes					
15	Hire company's own competent native language-speaking employee, even though some of the staff understand native language					
16	Provide dispute settlement clauses in the contract					
17	Only take over the local partner's competent staff when merging with the partner or during the contract process					
18	Sign formal employment contract with every staff					
19	Decide on recruitment and selection criteria in					

	consultation with one local partner					
20	Offer training to new and existing staff					
21	Gain accurate financial and other information from international and independent security and risk evaluation agencies					
22	Get Letter of Credit from local government					
23	Adopt alternatives to contract payment, e.g. land development rights, resource swap					
24	Secure standby cash flow in advance					
25	Measure and price Bills of Quantities properly during bidding stage					
26	Develop a clear and appropriate plan and control schedule and cost					
27	Obtain payment and performance bonds from local and international banks					
28	Enter into fixed rate loan contract with lending banks					
29	Adopt as much as possible domestic product/labour to reduce cost					
30	Undertake pre-project planning to minimize design errors					
31	Get Design liability insurance					
32	Adopt Design & Build option which enables contractor to design in harmony with site conditions thus minimizing design/drawing dispute					
33	Insure all of the insurable force majeure risks					
34	Obtain local government guarantee to adjust tariff or extend concession period					
35	Employ reputable third party consultant to forecast market demand					
EN36	Conduct market study and obtain exact information of competitive projects					
EN37	Establish agreement with local government agency to reduce/ exempt from import formalities					

28. Apart from the mitigation measures identified above. Kindly indicate others you have employed for a particular risk factor using your wealth of experience……

Thanks very much for your time.

Appendix B: End user's Questionnaire survey

13th July, 2010.

Dear Sir/Madam:

FRAMEWORK FOR RISK MANAGEMENT IN PRIVATELY FINANCED MARKET PROJECT IN NIGERIA.

The above research is investigating the key risk factors in privately financed projects in Nigeria. The nation has recently embraced private sector participation in infrastructure provision.

This work is part of the effort to assess how projects (i.e the markets procured using PPP) have met one of its major objectives viz: "consumer satisfaction", Your assistance in sparing approximately 15minutes to share your valuable knowledge and experience by completing the attached questionnaire will be highly appreciated.

Please be assured that any information given will be treated in the strictest confidence and used for research purposes only. If you desire to have the report of the survey, we shall be delighted to send you a copy. Please indicate your email address in the background information section of the questionnaire.

We have also attached a prepaid envelope for the return of the questionnaire. We would be very grateful if it could be returned at your earliest convenience.

Thanks in anticipation.

Yours Sincerely,

Awodele Oluwaseyi
(PhD Research Student)

Prof. Stephen Ogunlana
(Research Main Project Supervisor)

Dr. Ibrahim Motawa
(Research Co-Project Supervisor)

1.0 Layout of the instrument

The questionnaire has been structured in to two major parts in line with the purpose of the survey which is to assess consumer satisfaction with projects procured through PPP arrangement. The first part comprises background questions about the respondents. The second part deals with general issues on their satisfaction with the final product (i.e PPP market projects) and investigates what they feel should be done to improve their satisfaction.

SECTION 1 ASSESSING USERS SATISFACTION WITH THE PROJECT

PART A

Instruction: This section seeks to assess your satisfaction as trader with the shopping facility. If you are a shopper in the market and not a trader please go to part B.

Kindly indicate your level of satisfaction by ticking (√) where appropriate using the scale shown below.

Highly Satisfied	Satisfied	Somehow Satisfied	Dissatisfied	Highly Dissatisfied
5	4	3	2	1

S/No	Dimensions	RATING				
		5	4	3	2	1
1.1	Amount paid for the facility					
1.2	Accessibility of the facility					
1.3	Attractiveness of facilities					
1.4	Ease of locating what you are selling by the buyer					
1.5	Modern look of the facility					
1.6	Appropriateness of the size of the facility					
1.7	Ease of transporting goods in and out of the facility					
1.8	Adequacy of parking spaces					
1.9	The environment around the facility					
1.10	Security in and around the market					
1.11	Response to maintenance issues by the facility manager					
1.12	General neatness of the market					

PART B

Instruction: This section seeks to assess your satisfaction as a shopper with the shopping facility. Please indicate your level of satisfaction by ticking (√) where appropriate using the scale shown below.

Highly Satisfactory	Satisfactory	Somehow Satisfactory	Slightly Satisfactory	Not Satisfactory
5	4	3	2	1

S/No	Dimensions	RATING				
		5	4	3	2	1
1.1	Accessibility of the facility					
1.2	Attractiveness of facilities					
1.3	Ease of locating what you want to buy as buyer					
1.4	Modern look of the facility					
1.5	Easy of transporting goods in and out of the facility					
1.6	Adequacy of parking spaces					
1.7	Security in and around the market					
1.8	Price of goods in the market compared with other places					
1.9	The environment around the facility					
1.10	General neatness of the market					

SECTION 2 COMPARING USERS SATISFACTION WITH THE NEW MARKET PROJECT AND THE OLD FACILITY

PART A

Instruction: This section seeks to compare your satisfaction as trader with the present shopping facility as compared to the Old shopping facility. If you are a shopper in the market please go to part B.

Kindly indicate your level of satisfaction by ticking (√) where appropriate using the scale shown below.

Very Effective	Effective	Somehow effective	Slightly effective	Not effective
5	4	3	2	1

S/No	Dimensions	RATING				
		5	4	3	2	1
2.1	Amount paid for the facility					
2.2	Accessibility of the facility					
2.3	Attractiveness of facilities					
2.4	Ease of locating what you are selling by the buyer					
2.5	Modern look of the facility					
2.6	Appropriateness of the size of the facility					
2.7	Ease of transporting goods in and out of the facility					
2.8	Adequacy of parking spaces					
2.9	The environment around the facility					
2.10	Security in and around the market					
2.11	Response to maintenance issues by the facility manager					
2.12	General neatness of the market					

PART B

Instruction: This section sought to compare your satisfaction as a shopper with the present shopping facility as compared to the Old shopping facility. Please indicate your level of satisfaction by ticking (√) where appropriate using the scale shown below.

Very Effective	Effective	Somehow effective	Slightly effective	Not effective
5	4	3	2	1

S/No	Dimensions	RATING				
		5	4	3	2	1
2.1	Accessibility of the facility					
2.2	Attractiveness of facilities					
2.3	Ease of locating what you want to buy as buyer					
2.4	Modern look of the facility					
2.5	Ease of transporting goods in and out of the facility					
2.6	Adequacy of parking spaces					
2.7	Security in and around the market					
2.8	Price of goods in the market compared with other places					
2.9	The environment around the facility					
2.10	General neatness of the market					

3.0 How would you rate your overall satisfaction of the market?

Satisfactory ☐ Not Satisfactory ☐ Indifferent ☐

4.0 Kindly suggest possible things that you expected that can be done to improve your level of satisfaction with the market.

SECTION 3 GENERAL INFORMATION

5.1 Name of respondent (optional)…….....

5.2 E mail Address (optional)……

5.3. Your connection with the market: Shopper ☐ Trader ☐

5.4. How long have you been using the facility? 1-5 ☐ 6-10 ☐ 11-20 ☐ 21-30 ☐

5.5. How often do you use the facility?

(i) Highly frequent ☐ (ii) Frequent ☐ (iii) Slightly frequent ☐

(iv) Not frequent ☐ (v) Slightly frequent ☐

5.6. Have you traded or shopped before in other markets within the locality? Yes ☐ No ☐

5.7. Why do you choose to shop or trade in this market and not other markets in town?

5.8. What is your highest academic qualification? HND ☐ B.Tech/BSc ☐ M.Tech ☐
PhD ☐ Others , please specify…….

Thanks for your time.

Appendix C: Case Study Protocol (CSP) used for the conduct of the interviews

FRAMEWORK FOR RISK MANAGEMENT IN PRIVATELY FINANCED MARKET PROJECT IN NIGERIA.

1.0 Introduction:

The above research is investigating the key risk factors in privately financed market projects in Nigeria The nation has recently embraced private sector participation in the provision of these shopping facilities.

The research seeks to:

1. Develop a framework for identifying, categorizing and representing the risks associated with Public Private Partnership market projects in Nigeria.
2. Identify and evaluate the critical risks inherent with PPP market projects in Nigeria.
3. Evaluate the impact of these risk factors on stakeholder's satisfaction of the market projects.
4. Identify and evaluate the practical measures for mitigating these risks.
5. Formulate a risk management framework suitable for investors in PPP market development in Nigeria.

Your assistance in sparing us approximately I hour to share your valuable knowledge and experience through one on one interview which will be guided by this protocol will be highly appreciated.

Please be assured that any information given will be treated in the strictest confidence and used for research purposes only. If you desire to have a summary of our report at the end of the study, we shall be delighted to send you a copy.

Thanks in anticipation.

Yours Sincerely,

Oluwaseyi Awodele
(PhD Research Student)

Prof. Stephen Ogunlana
(Research Main Project Supervisor)

Dr. Ibrahim Motawa
(Research Co-Project Supervisor)

Section 1: Risk questions on a particular PPP market project.

1.1. What is your role in this market project? Contractor, sponsor, investor, public etc

…….....

1.2. What were the initial estimated and the final costs of the project?

…….....

1.3. Was the project actually completed on schedule?

…….....

1.4. How would you describe risk in the context of privately financed market projects?

…….....

…….....

…….....

1.5. In your view, what is the importance of risks and its management?

…….....

…….....

1.6 In your own organisation, do you have or adopt any risk management procedure?

Yes ☐ No ☐

1.7. If the answer to the question in 1.6 is yes, could you please give a brief explanation about its components? If no, could you please say why?

1.8. In your own opinion who do you think should be responsible for risk identification in PPP projects and why?

…….....

…….....

1.9. In this market project, who actually identified the risks?

1.10. What are the tools and techniques used for identifying risk in your project? e.g. Review techniques, Information gathering techniques, checklist, assumption analysis and diagramming techniques.

1.11 Do you have any risk register for the project and who developed the register?

…….....

…….....

1.12. At the inception of the project, how many risk factors did you identify as being likely to affect the project and what are they?

…….....

…….....

…….....

1.13 From conception stage through to construction stage what problems did you encounter, or what risk factors actually occurred.

…….....

…….....

…….....

1.14 Please rate the criticality of each risk factor you have identified in the course of the project on a Likert scale of 5-1 (where 1 = “Very low”, 2 = “Low”, 3 = “Medium”, 4 = “High” and 5 = “Very high”

1.15 A basic principle of risk allocation is that a risk should be allocated to the party best capable to manage it. Please indicate your allocation preferences to the risks identified in the project. Using the following preferences 1 = Private sector, 2 = Public sector, 3 = shared between public and private.

1.16. What are the tool and techniques used for analysing risk in the market project under review? E.g. Impact risk rating matrix, Brainstorming, Fuzzy set analysis, expected monetary value (EMV) Sensitivity analysis, Decision tree, Monte Carlo simulation etc.

……

……

……

1.17. What effect did those critical risk have on the project goals i.e. cost time and quality?

……

……

……

……

……

Section 2: Risk mitigation measures for PPP market projects.

2.1. In order to prevent the occurrence or reduce the impact of the risk factors you identified earlier, what mitigating measures will you suggest for each risk factor?

..... ……

……

……

2.2. On the market project under review, what mitigation measure did you put in place to prevent the occurrence or reduced the impact of the risk factors?

……

……

……

2.3. How would rate the project in term of achieving the project objectives i.e. time, cost and quality.

……

2.4. Would you be interested in commenting on or reading through the final draft of the report of this interview?.....……

Section 3: Description of the case study entity

3.1 Name of organization …….....

3.2. Type of Establishment: Consulting ☐ Contracting ☐ Banking ☐
Insurance company ☐ Public sector/services ☐

3.3. Academic Qualification: HND ☐ B.Tech/BSc ☐ M.Tech ☐ PhD ☐
Others specify ……

3.4. Profession: Quantity Surveying ☐ Architecture ☐ Engineering ☐
Building ☐ Others (specify)……..

3.5. Years in Service: 1-5 ☐ 6-10 ☐ 11-20 ☐ 21-30 ☐ > 30 ☐

3.6. Designation of Respondent in the establishment: Chief Executive/Managing ☐
Director/President ☐ Project Manager ☐ Financial Adviser ☐
Facilities Manager ☐ Cost Adviser ☐ Architect ☐ Engineer ☐
Others (specify)

3.7. Have you been involved in any other market project executed under public-private partnership arrangement? Yes ☐ No ☐

3.8 If yes, please give details of the project by stating of name, location, your role in the project i.e contractor, sponsor, lender investor, public etc?

Thanks for your time.

APPENDIX D_i: Rating of probability of occurrence exogenous risk factors

Exogenous Risk Factor	Rating of Probability/likelihood of Occurrence of risk events											
	Governt. *(N=7)*		Sponsor *(N=11)*		Contractor*(N=43)*		Consultant*(N=32)*		Overall Rating		Chi-Square Value	Kruskal Wallis Sig p
	MS	Ranking	MS	Ranking	MS	Ranking	MS	Ranking	MS	Ranking		
V20AEX1	2.86	16	4.45	2	3.98	1	4.06	1	3.98	1	10.326	0.016*
V20AEX2	3.43	7	3.09	14	3.28	16	3.34	10	3.29	13	1.439	0.696
V20AEX3	3.00	15	3.18	11	3.33	13	3.66	4	3.40	9	7.641	0.054
V20AEX4	3.14	9	3.73	4	3.74	3	3.94	3	3.76	3	1.837	0.607
V20AEX5	3.14	9	3.27	9	3.53	9	4.03	2	3.65	5	5.033	0.169
V20AEX6	2.71	20	2.45	20	3.44	10	3.25	13	3.20	15	10.057	0.018*
V20AEX7	3.14	9	3.36	6	3.74	3	3.47	8	3.56	6	2.395	0.494
V20AEX8	3.14	9	2.91	17	3.56	8	3.25	13	3.34	11	5.148	0.161
V20AEX9	3.14	9	3.36	6	3.60	7	3.28	12	3.43	8	2.306	0.511
V20AEX10	3.14	9	2.18	22	3.35	11	3.53	7	3.26	13	11.711	0.008*
V20AEX11	3.71	5	3.36	6	3.33	13	3.31	11	3.35	10	1.567	0.667
V20AEX12	1.86	24	3.18	11	2.95	21	2.91	19	2.88	22	6.579	0.087
V20AEX13	3.29	8	4.55	1	3.93	2	3.59	5	3.84	2	10.212	0.017*
V20AEX14	2.86	16	3.18	11	3.65	6	3.47	8	3.47	7	5.376	0.146
V20AEX15	2.86	16	2.18	22	2.70	23	2.44	24	2.56	24	4.909	0.179
V20AEX16	3.57	6	3.00	16	2.56	24	2.66	23	2.72	23	7.920	0.048*
V20AEX17	2.86	16	3.27	9	2.86	22	2.97	18	2.95	20	1.290	0.732
V20AEX18	2.43	23	3.64	5	3.35	11	3.09	15	3.23	14	4.397	0.222
V20AEX19	4.43	1	3.82	3	3.67	5	3.59	5	3.72	4	4.296	0.231

V20AEX20	4.14	2.5	2.45	20	3.09	19	3.00	17	3.06	16.5	9.414	0.024*
V20AEX21	3.86	4	1.73	24	3.23	17	3.06	16	3.04	18	14.364	0.002*
V20AEX22	4.14	2.5	2.55	19	3.02	20	2.88	20	3.00	19	6.631	0.085
V20AEX23	2.71	20	2.73	18	3.12	18	2.69	22	2.89	21	3.581	0.310
V20AEX24	2.71	20	3.09	14	3.30	15	2.81	21	3.06	16.5	3.302	0.347

APPENDIX D_{ii}: Rating of probability of occurrence endogenous risk factors

Endogenous Risk Factor	**Rating of Probability/likelihood of Occurrence of risk events**											
	Governt. *(N=7)*		**Sponsor** *(N=11)*		**Contractor***(N=43)*		**Consultant***(N=32)*		**Overall Rating**		**Chi-Square Value**	**Kruskal Wallis Sig p**
	MS	**Ranking**	**MS**	**Ranking**	**MS**	**Ranking**	**MS**	**Ranking**	**MS**	**Ranking**		
V20AEN1	2.86	25	2.73	31	3.60	12	3.78	11	3.51	13	9.382	0.025*
V20AEN2	2.43	38	3.64	6	3.42	21	3.03	37	3.24	27	7.476	0.058
V20AEN3	2.43	38	3.73	4	3.23	28	3.13	35	3.19	28	6.198	0.102
V20AEN4	3.43	14	3.64	6	3.23	28	3.19	30	3.28	26	2.098	0.552
V20AEN5	3.29	16	3.09	22	2.98	41	3.19	30	3.09	34	2.371	0.499
V20AEN6	3.43	14	2.82	28	3.93	3	4.06	1	3.81	5	11.483	0.009*
V20AEN7	2.14	44	4.09	1	3.74	7	3.94	4	3.73	6	12.684	0.005*
V20AEN8	3.86	6	2.82	28	3.49	16	3.56	12	3.46	16	8.554	0.036*
V20AEN9	3.57	10	2.27	41	3.35	23	3.53	15	3.30	24	12.287	0.006*
V20AEN10	2.43	38	2.18	44	3.21	30	3.53	15	3.14	31	14.091	0.003*
V20AEN11	2.86	25	3.09	22	3.47	17	3.56	12	3.41	18	7.106	0.069
V20AEN12	2.86	25	2.64	33	3.40	22	3.88	8	3.43	17	14.736	0.002*

V20AEN13	3.57	10	3.45	11	3.30	25	3.81	10	3.52	12	7.952	0.047*
V20AEN14	2.57	35	2.45	34	3.60	12	3.91	7	3.49	15	21.779	0.000*
D_{ii} Contd'												
V20AEN15	4.00	4	3.18	20	3.44	20	3.16	33	3.35	21	7.011	0.072
V20AEN16	2.43	38	2.27	41	2.88	44	3.25	26	2.90	43	7.890	0.048*
V20AEN17	4.00	4	3.36	17	3.58	15	3.34	21	3.51	13	4.395	0.222
V20AEN18	3.57	10	2.45	34	3.30	25	3.16	33	3.17	30	11.174	0.011*
V20AEN19	2.71	31	2.36	38	3.28	27	3.28	25	3.13	33	10.241	0.017*
V20AEN20	4.14	3	3.55	9	3.84	4	4.06	1	3.90	3	4.262	0.235
V20AEN21	4.43	1	4.09	1	3.72	8	4.00	3	3.91	2	5.844	0.119
V20AEN22	2.71	31	3.00	25	3.21	30	2.88	41	3.03	38	1.876	0.598
V20AEN23	2.71	31	2.73	31	3.19	32	2.91	40	3.00	41	2.460	0.482
V20AEN24	2.43	38	3.09	22	3.65	10	3.19	30	3.33	22	8.509	0.037*
V20AEN25	3.57	10	3.55	9	3.79	6	3.50	17	3.65	9	2.027	0.567
V20AEN26	3.00	23	3.18	20	3.81	5	3.94	4	3.72	7	15.253	0.002*
V20AEN27	3.29	16	2.91	26	3.47	17	3.41	19	3.37	19	3.353	0.340
V20AEN28	3.14	18	2.36	38	3.02	38	3.22	29	3.02	39	7.180	0.066
V20AEN29	2.43	38	3.45	11	3.12	35	3.03	37	3.08	36	3.170	0.366
V20AEN30	3.00	23	3.36	17	3.70	9	3.56	12	3.56	11	4.499	0.212
V20AEN31	2.57	35	2.27	41	4.60	2	3.25	26	3.71	8	16.589	0.001*
V20AEN32	3.71	8	2.36	38	3.47	17	3.31	24	3.30	24	16.954	0.001*
V20AEN33	3.71	8	2.45	34	3.63	11	3.88	8	3.58	10	18.477	0.000*
V20AEN34	3.14	18	3.64	6	3.12	35	2.72	44	3.04	37	8.735	0.033*
V20AEN35	3.86	6	3.73	4	3.16	33	3.41	19	3.37	19	2.566	0.464

V20AEN36	4.29	2	4.09	1	3.60	12	3.94	4	3.83	4	3.959	0.266
V20AEN37	3.14	18	3.45	11	3.09	37	3.09	36	3.14	31	1.383	0.710
D_{ii} Contd'												
V20AEN38	2.86	25	3.45	11	3.33	24	3.33	23	3.31	23	2.199	0.532
V20AEN39	3.14	18	3.45	11	4.88	1	3.34	21	4.05	1	1.991	0.574
V20AEN40	2.57	35	3.45	11	3.02	38	3.44	18	3.18	29	7.043	0.071
V20AEN41	2.86	25	3.36	17	3.14	34	2.97	39	3.09	34	2.103	0.551
V20AEN42	2.71	31	2.82	28	2.95	43	3.25	26	3.02	39	3.654	0.301
V20AEN43	3.14	18	2.91	26	3.00	40	2.81	43	2.94	42	0.559	0.906
V20AEN44	2.86	25	2.45	34	2.98	41	2.88	41	2.87	44	2.276	0.517

Appendix E: Coding employed in the computation of results for exogenous risk

Coding of Risk			Description
Occurrences	**Impacts**	**Allocation**	**Exogenous Risk factors**
V20AEX1	V20BEX1	V20CEX1	Unstable government
V20AEX2	V20BEX2	V20CEX2	Possible expropriation/ nationalization of assets
V20AEX3	V20BEX3	V20CEX3	Poor public decision making process
V20AEX4	V20BEX4	V20CEX4	Strong political opposition/hostility
V20AEX5	V20BEX5	V20CEX5	Inconsistencies in government policies
V20AEX6	V20BEX6	V20CEX6	Poor financial market
V20AEX7	V20BEX7	V20CEX7	Inflation rate volatility
V20AEX8	V20BEX8	V20CEX8	Interest rate volatility
V20AEX9	V20BEX9	V20CEX9	Exchange rate fluctuation
V20AEX10	V20BEX10	V20CEX10	Influential economic event(boom/recession)
V20AEX11	V20BEX11	V20CEX11	Legislation change/inconsistencies
V20AEX12	V20BEX12	V20CEX12	Change in tax regulation
V20AEX13	V20BEX13	V20CEX13	Corruption and lack of respect for law
V20AEX14	V20BEX14	V20CEX14	Import/Export restrictions
V20AEX15	V20BEX15	V20CEX15	Rate of returns restrictions
V20AEX16	V20BEX16	V20CEX16	Industrial regulation change
V20AEX17	V20BEX17	V20CEX17	Lack of tradition of private provision of public services
V20AEX18	V20BEX18	V20CEX18	Public opposition to projects
V20AEX19	V20BEX19	V20CEX19	Non-involvement of host-community
V20AEX20	V20BEX20	V20CEX20	Cultural differences between main stakeholders
V20AEX21	V20BEX21	V20CEX21	Force majeure
V20AEX22	V20BEX22	V20CEX22	Weather
V20AEX23	V20BEX23	V20CEX23	Environment
V20AEX24	V20BEX24	V20CEX24	Geotechnical conditions

Appendix F: Coding employed in the computation of results for Endogenous risk factors.

Coding of Risk			Description
Occurrences	Impacts	Allocation	Endogenous Risk factors
V20AEN1	V20BEN1	V20CEN1	Land acquisition/site availability
V20AEN2	V20BEN2	V20CEN2	Level of demand for the project
V20AEN3	V20BEN3	V20CEN3	Prolonged negotiation period prior to initiation
V20AEN4	V20BEN4	V20CEN4	Competition risk
V20AEN5	V20BEN5	V20CEN5	Fault in tender specification
V20AEN6	V20BEN6	V20CEN6	Availability of finance
V20AEN7	V20BEN7	V20CEN7	High finance cost
V20AEN8	V20BEN8	V20CEN8	Lack of creditworthiness
V20AEN9	V20BEN9	V20CEN9	Liquidity
V20AEN10	V20BEN10	V20CEN10	Depository
V20AEN11	V20BEN11	V20CEN11	High bidding costs
V20AEN12	V20BEN12	V20CEN12	Inability to service debt
V20AEN13	V20BEN13	V20CEN13	Lack of government guarantees
V20AEN14	V20BEN14	V20CEN14	Bankruptcy of concessionaire
V20AEN15	V20BEN15	V20CEN15	Financial attraction of project to investors
V20AEN16	V20BEN16	V20CEN16	Residual value (after concession period)
V20AEN17	V20BEN17	V20CEN17	Delay in project approvals and permits
V20AEN18	V20BEN18	V20CEN18	Design deficiency
V20AEN19	V20BEN19	V20CEN19	Unproven engineering techniques
V20AEN20	V20BEN20	V20CEN20	Construction cost overrun
V20AEN21	V20BEN21	V20CEN21	Construction time overrun
V20AEN22	V20BEN22	V20CEN22	Availability of appropriate labour/material
V20AEN23	V20BEN23	V20CEN23	Manpower problem associated with trade unions
V20AEN24	V20BEN24	V20CEN24	Late design changes
V20AEN25	V20BEN25	V20CEN25	Poor quality of workmanship
V20AEN26	V20BEN26	V20CEN26	Excessive contract variation
V20AEN27	V20BEN27	V20CEN27	Insolvency/default of subcontractors and suppliers
V20AEN28	V20BEN28	V20CEN28	Risk regarding pricing of product/service
V20AEN29	V20BEN29	V20CEN29	Operational revenue below projection
V20AEN30	V20BEN30	V20CEN30	Operation cost overrun
V20AEN31	V20BEN31	V20CEN31	Low operating productivity
V20AEN32	V20BEN32	V20CEN32	Maintenance more frequent than expected
V20AEN33	V20BEN33	V20CEN33	Maintenance cost higher than expected
V20AEN34	V20BEN34	V20CEN34	Competitive market (a product with close substitute)
V20AEN35	V20BEN35	V20CEN35	Life of facility shorter than anticipated
V20AEN36	V20BEN36	V20CEN36	Inadequate experience in PPP
V20AEN37	V20BEN37	V20CEN37	Organization and coordination risk
V20AEN38	V20BEN38	V20CEN38	Inadequate distribution of responsibilities and risks
V20AEN39	V20BEN39	V20CEN39	Lack of commitment from public / private partner
V20AEN40	V20BEN40	V20CEN40	Inadequate distribution of authority between partner
V20AEN41	V20BEN41	V20CEN41	Different working methods/know-how between partners
V20AEN42	V20BEN42	V20CEN42	Counter party's creditworthiness
V20AEN43	V20BEN43	V20CEN43	Staff crises
V20AEN44	V20BEN44	V20CEN44	Third party tort liability

Appendix G: Coding employed in the computation of results for risk mitigation measures

Coding	Mitigation Measures
VRM21	Ensure the project complies with local development plan
VRM22	Maintain good relationship with local government and higher officials
VRM23	Obtain insurance for political risks
VRM24	Include clauses for delays and additional payments in contract, which occur due to new rules or change in law
VRM25	Ensure the approval is sought at the right local government departments
VRM26	Try to work directly with the business connections, i.e do not hire broker or middleman
VRM27	Obtain all necessary approvals in timely manner to minimize chance for corrupt individual to obstruct work
VRM28	Develop contingency plans and obtain insurance for expropriation
VRM29	Develop own contingency for possible political instability, such as plan for emergency evacuation
VRM30	Pay careful attention to contract translation
VRM31	Insist on having trustworthy people on key places within the JV
VRM32	Establish JV with local partners especially the central local government agencies or state owned enterprise
VRM33	Transfer ordinary technology only but keep the key ones
VRM34	Study carefully the differential taxation and find legal and reasonable measures to reduce taxes
VRM35	Hire company's own competent native language-speaking employee, even though some of the staff understand native language
VRM36	Provide dispute settlement clauses in the contract
VRM37	Only take over the local partner's competent staff when merging with the partner or during the contract process
VRM38	Sign formal employment contract with every staff
VRM39	Decide on recruitment and selection criteria in consultation with one local partner
VRM40	Offer training to new and existing staff
VRM41	Gain accurate financial and other information from international and independent security and risk evaluation agencies
VRM42	Get Letter of Credit from local government
VRM43	Adopt alternatives to contract payment, e.g. land development rights, resource swap
VRM44	Secure standby cash flow in advance
VRM45	Measure and price Bills of Quantities properly during bidding stage
VRM46	Develop a clear and appropriate plan and control schedule and cost
VRM47	Obtain payment and performance bonds from local and international banks
VRM48	Enter into fixed rate loan contract with lending banks
VRM49	Adopt as much as possible domestic product/labour to reduce cost
VRM50	Undertake pre-project planning to minimize design errors
VRM51	Get Design liability insurance
VRM52	Adopt Design & Build option which enables contractor to design in harmony with site conditions thus minimizing design/drawing dispute
VRM53	Insure all of the insurable force majeure risks
VRM54	Obtain local government guarantee to adjust tariff or extend concession period

VRM55	Employ reputable third party consultant to forecast market demand
VRM56	Conduct market study and obtain exact information of competitive projects
VRM57	Establish agreement with local government agency to reduce/ exempt from import formalities

APPENDIX J_i : Rating of Impact of exogenous risk factors

Exogenous Risk Factor	Rating of Impact of risk events											
	Governt. *(N=7)*		Sponsor *(N=11)*		Contractor*(N=43)*		Consultant*(N=32)*		Overall Rating		Chi-Square Value	Kruskal Wallis Sig p
	MS	Ranking	MS	Ranking	MS	Ranking	MS	Ranking	MS	Ranking		
V20BEX1	3.71	1	4.73	1	3.72	3	3.94	1	3.91	1	12.638	0.005
V20BEX2	2.71	11	3.27	13	2.81	23	3.16	12	2.98	19	2.762	0.430
V20BEX3	3.29	6	4.00	5	3.19	16	2.97	14	3.22	12	7.547	0.056
V20BEX4	3.57	2	4.64	2	3.51	7	3.69	3	3.71	3	10.398	0.015
V20BEX5	3.57	2	4.09	4	3.58	5	3.78	2	3.71	3	2.344	0.504
V20BEX6	3.29	6	3.91	6	3.67	4	3.38	8	3.57	6	3.919	0.270
V20BEX7	3.43	4	3.18	14	3.77	1	3.56	5	3.60	5	2.657	0.448
V20BEX8	3.43	4	2.73	20	3.56	6	3.13	13	3.30	9	6.206	0.102
V20BEX9	1.86	22	2.73	20	3.47	8	3.41	7	3.24	11	14.863	0.002
V20BEX10	1.86	22	3.55	10	3.40	12	3.34	9	3.28	10	10.038	0.018
V20BEX11	2.71	11	3.73	7	3.47	8	3.56	5	3.47	7	5.641	0.130
V20BEX12	2.14	20	3.55	10	3.42	11	2.63	21	3.06	15	11.576	0.009
V20BEX13	3.29	6	4.27	3	3.74	2	3.63	4	3.73	2	6.642	0.084
V20BEX14	3.14	9	3.64	9	3.47	8	3.25	11	3.39	8	1.623	0.654
V20BEX15	2.57	14	2.82	17	2.95	19	2.97	14	2.91	18	1.372	0.712
V20BEX16	2.86	10	3.09	16	2.65	24	2.72	18	2.74	22	2.010	0.570
V20BEX17	2.43	15	2.64	23	3.14	17	2.88	17	2.94	17	5.034	0.169
V20BEX18	2.43	15	3.18	14	3.26	14	2.97	14	3.09	14	2.468	0.481
V20BEX19	2.43	15	2.82	17	3.30	13	3.31	10	3.18	13	3.914	0.271
V20BEX20	2.71	11	2.64	23	2.91	20	2.47	22	2.71	23	3.919	0.270

J_i Contd’												
V20BEX21	2.29	19	2.82	17	2.98	18	2.69	20	2.81	20	2.901	0.407
V20BEX22	1.86	22	2.73	20	3.26	14	2.44	23	2.81	20	13.641	0.003
V20BEX23	2.14	20	3.36	12	2.84	22	2.31	24	2.67	24	10.470	0.015
V20BEX24	2.43	15	3.73	7	2.88	21	2.72	18	2.89	19	7.070	0.070

APPENDIX J_{ii}: Rating of Impact of endogenous risk factors

Endogenous Risk Factor	Rating of Impact of risk events											
	Governt. *(N=7)*		Sponsor *(N=11)*		Contractor*(N=43)*		Consultant*(N=32)*		Overall Rating		Chi-Square Value	Kruskal Wallis Sig p
	MS	Ranking	MS	Ranking	MS	Ranking	MS	Ranking	MS	Ranking		
V20BEN1	2.86	33	3.18	21	3.12	32	3.41	20	3.20	28	2.274	0.517
V20BEN2	2.86	33	4.09	2	3.09	34	3.13	33	3.20	28	6.802	0.078
V20BEN3	2.29	40	4.09	2	2.93	42	2.84	43	2.99	39	12.404	0.006
V20BEN4	2.71	36	3.82	4	3.19	27	2.94	39	3.14	32	5.027	0.170
V20BEN5	3.57	18	3.18	21	2.84	43	3.38	23	3.12	33	6.141	0.105
V20BEN6	3.43	26	3.55	7	3.74	2	4.00	2	3.78	1	2.935	0.402
V20BEN7	3.57	18	4.18	1	3.51	6	4.03	1	3.77	2	7.424	0.060
V20BEN8	3.57	18	3.55	7	3.40	13	3.88	5	3.59	7	4.630	0.201
V20BEN9	3.86	10	3.18	21	3.44	9	3.53	13	3.47	13	1.536	0.674
V20BEN10	2.43	39	3.09	30	3.33	19	3.28	28	3.22	26	2.414	0.491
V20BEN11	2.86	33	3.45	10	3.14	30	3.00	35	3.11	34	2.637	0.451
V20BEN12	3.57	18	3.18	21	3.21	26	3.53	13	3.34	19	2.352	0.503
V20BEN13	3.43	26	3.36	13	3.23	23	3.44	18	3.33	22	1.373	0.712
V20BEN14	4.43	1	3.55	7	3.42	12	3.59	10	3.57	8	5.048	0.168
V20BEN15	3.86	10	3.27	17	3.16	28	3.19	31	3.24	24	1.954	0.582
V20BEN16	2.71	36	2.73	36	2.84	43	3.19	31	2.94	41	4.000	0.261
V20BEN17	3.43	26	3.18	21	3.28	20	3.47	16	3.34	19	1.157	0.763
V20BEN18	3.43	26	3.45	10	3.47	8	3.59	10	3.51	11	0.648	0.885
V20BEN19	4.43	1	2.82	32	3.28	20	3.41	20	3.35	18	12.326	0.006

J_{ii}: Contd'

V20BEN20	3.29	31	3.64	5	3.53	4	3.97	3	3.68	3	4.637	0.200
V20BEN21	2.14	41	3.64	5	3.40	13	3.88	5	3.49	12	13.160	0.004
V20BEN22	2.71	36	3.18	21	3.23	23	2.84	43	3.05	36	3.157	0.368
V20BEN23	2.14	41	3.09	30	2.98	39	2.91	41	2.90	42	3.065	0.382
V20BEN24	4.14	5	3.18	21	3.35	17	3.34	26	3.39	15	4.946	0.176
V20BEN25	3.86	10	3.27	17	3.77	1	3.56	12	3.65	5	2.378	0.498
V20BEN26	4.14	5	2.82	32	3.65	3	3.91	4	3.68	3	13.743	0.003
V20BEN27	3.86	10	2.73	36	3.44	9	3.44	18	3.39	15	7.589	0.055
V20BEN28	3.57	18	2.18	42	3.23	23	3.47	16	3.22	26	16.148	0.001
V20BEN29	3.57	18	3.36	13	3.51	6	3.41	20	3.46	14	0.879	0.830
V20BEN30	3.71	15	3.45	10	3.00	36	3.22	30	3.18	31	3.701	0.296
V20BEN31	3.57	18	3.18	21	3.09	34	3.38	23	3.24	24	1.249	0.741
V20BEN32	3.57	18	2.55	41	3.40	13	3.50	15	3.34	19	9.048	0.029
V20BEN33	3.71	15	2.82	32	3.16	28	3.28	28	3.20	28	2.841	0.417
V20BEN34	3.86	10	3.27	17	2.98	39	2.97	37	3.08	35	5.230	0.156
V20BEN35	4.43	1	3.36	13	3.40	13	3.66	8	3.56	9	6.851	0.077
V20BEN36	4.43	1	3.18	21	3.44	9	3.84	7	3.62	6	9.879	0.020
V20BEN37	4.14	5	3.27	17	3.12	32	3.38	23	3.30	23	6.750	0.080
V20BEN38	3.71	15	3.36	13	3.35	17	3.34	26	3.38	17	1.278	0.734
V20BEN39	4.00	8	2.82	32	3.53	4	3.66	8	3.53	10	8.296	0.040
V20BEN40	1.86	44	2.64	38	3.00	36	2.94	39	2.85	44	7.604	0.055
V20BEN41	2.14	41	2.64	38	3.28	20	3.00	35	3.02	37	9.394	0.024
V20BEN42	3.43	26	2.64	38	2.98	39	3.13	33	3.02	37	5.502	0.139
V20BEN43	4.00	8	2.00	44	3.14	30	2.91	41	2.99	39	17.449	0.001

V20BEN44	3.14	32	2.09	43	3.00	36	2.97	37	2.89	43	11.323	0.010

APPENDIX K: Criticality Index of risk events

Risk Factor	Description	Criticality Index of the significant risk factors using their Probability Impact ratings							
		Overall ratings from likelihood of occurrence (PR)		Overall ratings from Impact of the risk (IR)		Risk Criticality Scoring from (PRxIR)		Criticality Index Rating	
		MS	Ranking	MS	Ranking	RC	Ranking	CI	Remark
V20AEX1	Unstable government	3.98	2	3.91	1	15.57	1	0.62	*Critical*
V20AEN6	Availability of finance	3.81	7	3.78	2	14.41	2	0.58	*Critical*
V20AEN20	Construction cost overrun	3.90	4	3.68	7	14.35	3	0.57	*Critical*
V20AEX13	Corruption and lack of respect for law	3.84	5	3.73	4	14.32	4	0.57	*Critical*
V20AEN39	Lack of commitment from public / private partner	4.05	1	3.53	16	14.30	5	0.57	*Critical*
V20AEN7	High finance cost	3.73	9	3.77	3	14.08	6	0.56	*Critical*
V20AEX4	Strong political opposition/hostility	3.76	8	3.71	5	13.96	7	0.56	*Critical*
V20AEN36	Inadequate experience in PPP	3.83	6	3.62	10	13.87	8	0.55	*Critical*
V20AEN26	Excessive contract variation	3.72	10	3.68	7	13.68	9	0.55	*Critical*
V20AEN21	Construction time overrun	3.91	3	3.49	18	13.68	9	0.55	*Critical*
V20AEX5	Inconsistencies in government policies	3.65	13	3.71	5	13.52	11	0.54	*Critical*
V20AEN25	Poor quality of workmanship	3.65	13	3.65	9	13.29	12	0.53	*Critical*
V20AEX7	Inflation rate volatility	3.56	16	3.60	11	12.82	13	0.51	*Critical*
V20AEN14	Bankruptcy of concessionaire	3.49	21	3.57	13	12.48	14	0.50	*Critical*
V20AEN8	Lack of creditworthiness	3.46	23	3.59	12	12.43	15	0.50	*Critical*
V20AEN31	Low operating productivity	3.71	12	3.24	34	12.01	16	0.48	*Somehow C*
V20AEN35	Life of facility shorter than anticipated	3.37	28	3.56	15	11.98	17	0.48	*Somehow C*

V20AEX19	Non-involvement of host-community	3.72	10	3.18	43	11.84	18	0.47	*Somehow C*
K: Contd'									
V20AEX14	Import/Export restrictions	3.47	22	3.39	22	11.76	19	0.47	*Somehow C*
V20AEN17	Delay in project approvals and permits	3.51	19	3.34	27	11.72	20	0.47	*Somehow C*
V20AEN13	Lack of government guarantees	3.52	18	3.33	30	11.72	20	0.47	*Somehow C*
V20AEX11	Legislation change/inconsistencies	3.35	30	3.47	19	11.65	22	0.47	*Somehow C*
V20AEN33	Maintenance cost higher than expected	3.58	15	3.20	40	11.47	23	0.46	*Somehow C*
V20AEN12	Inability to service debt	3.43	24	3.34	27	11.47	23	0.46	*Somehow C*
V20AEN9	Liquidity	3.30	35	3.47	19	11.47	23	0.46	*Somehow C*
V20AEX6	Poor financial market	3.20	42	3.57	13	11.44	26	0.46	*Somehow C*
V20AEN27	Insolvency/default of subcontractors and suppliers	3.37	28	3.39	22	11.40	27	0.46	*Somehow C*
V20AEN30	Operation cost overrun	3.56	16	3.18	43	11.33	28	0.45	*Somehow C*
V20AEN24	Late design changes	3.33	33	3.39	22	11.29	29	0.45	*Somehow C*
V20AEN1	Land acquisition/site availability	3.51	19	3.20	40	11.23	30	0.45	*Somehow C*
V20AEN38	Inadequate distribution of responsibilities and risks	3.31	34	3.38	25	11.17	31	0.45	*Somehow C*
V20AEN18	Design deficiency	3.17	45	3.51	17	11.12	32	0.44	*Somehow C*
V20AEX9	Exchange rate fluctuation	3.43	24	3.24	34	11.10	33	0.44	*Somehow C*
V20AEX8	Interest rate volatility	3.34	32	3.30	31	11.04	34	0.44	*Somehow C*
V20AEN32	Maintenance more frequent than expected	3.30	35	3.34	27	11.04	34	0.44	*Somehow C*
V20AEX3	Poor public decision making process	3.40	27	3.22	37	10.92	36	0.44	*Somehow C*
V20AEN15	Financial attraction of project to investors	3.35	30	3.24	34	10.86	37	0.43	*Somehow C*
V20AEX10	Influential economic event(boom/recession)	3.26	39	3.28	33	10.69	38	0.43	*Somehow C*
V20AEN29	Operational revenue below projection	3.08	51	3.46	21	10.65	39	0.43	*Somehow C*
V20AEN11	High bidding costs	3.41	26	3.11	47	10.59	40	0.42	*Somehow C*

V20AEN19	Unproven engineering techniques	3.13	48	3.35	26	10.50	41	0.42	*Somehow C*
K: Contd'									
V20AEN2	Level of demand for the project	3.24	40	3.20	40	10.37	42	0.41	*Somehow C*
V20AEN37	Organization and coordination risk	3.14	46	3.30	31	10.36	43	0.41	*Somehow C*
V20AEN4	Competition risk	3.28	38	3.14	45	10.30	44	0.41	*Somehow C*
V20AEN10	Depository	3.14	49	3.22	37	10.09	45	0.40	*Somehow C*
V20AEX18	Public opposition to projects	3.23	41	3.09	48	9.95	46	0.40	*Somehow C*
V20AEX2	Possible expropriation/ nationalization of assets	3.29	37	2.98	56	9.80	47	0.39	*Somehow C*
V20AEN28	Risk regarding pricing of product/service	3.02	57	3.22	37	9.71	48	0.39	*Somehow C*
V20AEN5	Fault in tender specification	3.09	49	3.12	46	9.62	49	0.38	*Somehow C*
V20AEN3	Prolonged negotiation period prior to initiation	3.19	43	2.99	54	9.55	50	0.38	*Somehow C*
V20AEN34	Competitive market (a product with close substitute)	3.04	54	3.08	49	9.36	51	0.37	*Somehow C*
V20AEN41	Different working methods/know-how between partners	3.09	49	3.02	52	9.32	52	0.37	*Somehow C*
V20AEN22	Availability of appropriate labour/material	3.03	56	3.05	51	9.26	53	0.37	*Somehow C*
V20AEN42	Counter party's creditworthiness	3.02	57	3.02	52	9.13	54	0.37	*Somehow C*
V20AEN40	Inadequate distribution of authority between partner	3.18	44	2.85	63	9.07	55	0.36	*Somehow C*
V20AEX24	Geotechnical conditions	3.06	52	2.89	61	8.86	56	0.35	*Somehow C*
V20AEX12	Change in tax regulation	2.88	65	3.06	50	8.83	57	0.35	*Somehow C*
V20AEN43	Staff crises	2.94	62	2.99	54	8.77	58	0.35	*Somehow C*
V20AEN23	Manpower problem associated with trade unions	3.00	59	2.90	60	8.71	59	0.35	*Somehow C*
V20AEX17	Lack of tradition of private provision of public services	2.95	61	2.94	57	8.65	60	0.35	*Somehow C*
V20AEX21	Force majeure	3.04	54	2.81	64	8.54	61	0.34	*Somehow C*
V20AEN16	Residual value (after concession period)	2.90	63	2.94	57	8.52	62	0.34	*Somehow C*

V20AEX22	Weather	3.00	59	2.81	64	8.42	63	0.34	*Somehow C*
K: Contd'									
V20AEN44	Third party tort liability	2.87	66	2.89	61	8.30	64	0.33	*Somehow C*
V20AEX20	Cultural differences between main stakeholders	3.06	52	2.71	67	8.30	64	0.33	*Somehow C*
V20AEX23	Environment	2.89	64	2.67	68	7.71	66	0.31	*Somehow C*
V20AEX16	Industrial regulation change	2.72	67	2.74	66	7.46	67	0.30	*Somehow C*
V20AEX15	Rate of returns restrictions	2.56	68	2.91	59	7.46	67	0.30	*Somehow C*

APPENDIX L_i: Risk Allocation preferences

Exogenous Risk Factor	**Risk allocation preferences**											
	Governt. *(N=7)*		**Sponsor** *(N=11)*		**Contractor***(N=43)*		**Consultant***(N=32)*		**Overall Rating**		**Chi-Square Value**	**Kruskal Wallis Sig p**
	MS	**Allocate**	**MS**	**Allocate**	**MS**	**Allocate**	**MS**	**Allocate**	**MS**	**Allocate**		
V20CEX1	1.00	Public	1.00	Public	1.00	Public	1.00	Public	1.00	Public	0.00	1.000
V20CEX2	2.00	Private	2.18	Private	1.93	Private	2.13	Private	2.03	Private	1.73	0.630
V20CEX3	2.43	Private	2.82	shared	2.35	Private	2.56	shared	2.48	Private	2.88	0.410
V20CEX4	1.86	Private	2.64	shared	2.21	Private	2.44	Private	2.31	Private	3.90	0.272
V20CEX5	1.00	Public	1.00	Public	1.00	Public	1.00	Public	1.00	Public	0.00	1.000
V20CEX6	2.71	shared	3.00	shared	2.53	shared	2.69	shared	2.66	shared	3.45	0.327
V20CEX7	2.14	Private	1.55	Private	1.98	Private	1.84	Private	1.89	Private	2.59	0.459
V20CEX8	2.14	Private	1.55	Private	1.98	Private	1.84	Private	1.89	Private	2.59	0.459
V20CEX9	2.14	Private	1.73	Private	2.16	Private	2.13	Private	2.10	Private	1.73	0.631
V20CEX10	3.00	shared	3.00	shared	3.00	shared	3.00	shared	3.00	shared	0.00	1.000
V20CEX11	1.00	Public	1.00	Public	1.00	Public	1.00	Public	1.00	Public	0.00	1.000

V20CEX12	1.00	Public	1.00	Public	1.00	Public	1.00	Public	1.00	Public	0.00	1.000
V20CEX13	2.43	Private	2.82	shared	2.86	shared	2.88	shared	2.83	shared	3.88	0.275
V20CEX14	1.00	Public	1.00	Public	1.00	Public	1.00	Public	1.00	Public	0.00	1.000
V20CEX15	2.14	Private	2.73	shared	2.53	shared	2.66	shared	2.57	shared	4.16	0.244
V20CEX16	1.29	Public	1.27	Public	1.26	Public	1.34	Public	1.29	Public	0.70	0.873
V20CEX17	1.86	Private	1.64	Private	2.09	Private	2.06	Private	2.01	Private	2.26	0.520
V20CEX18	2.71	shared	2.91	shared	2.93	shared	2.94	shared	2.91	shared	3.88	0.275
V20CEX19	2.29	Private	2.27	Private	2.51	shared	2.50	shared	2.46	Private	3.04	0.386
V20CEX20	3.00	shared	3.00	shared	3.00	shared	3.00	shared	3.00	shared	0.00	1.000
V20CEX21	2.71	shared	2.91	shared	2.93	shared	2.94	shared	2.91	shared	3.88	0.275
V20CEX22	3.00	shared	2.82	shared	2.81	shared	2.72	shared	2.80	shared	3.05	0.384
V20CEX23	3.00	shared	3.00	shared	3.00	shared	3.00	shared	3.00	shared	0.00	1.000
V20CEX24	2.71	shared	2.91	shared	2.67	shared	2.78	shared	2.74	shared	2.88	0.410

APPENDIX L_{ii}: Risk Allocation preferences

Endogenous Risk Factor	**Risk allocation preferences**											
	Governt. *(N=7)*		**Sponsor** *(N=11)*		**Contractor***(N=43)*		**Consultant***(N=32)*		**Overall Rating**		**Chi-Square Value**	**Kruskal Wallis Sig p**
	MS	**Allocate**	**MS**	**Allocate**	**MS**	**Allocate**	**MS**	**Allocate**	**MS**	**Allocate**		
V20CEN1	1.29	Public	1.09	Public	1.07	Public	1.06	Public	1.09	Public	3.88	0.275
V20CEN2	2.71	shared	2.73	shared	2.49	Private	2.50	shared	2.54	shared	3.04	0.386
V20CEN3	3.00	shared	3.00	shared	3.00	shared	3.00	shared	3.00	shared	0.00	1.000
V20CEN4	2.43	Private	2.45	Private	2.23	Private	2.16	Private	2.25	Private	1.53	0.675
V20CEN5	1.71	Private	1.91	Private	1.93	Private	1.94	Private	1.91	Private	3.88	0.275
V20CEN6	2.14	Private	2.73	shared	2.53	shared	2.66	shared	2.57	shared	4.16	0.244

V20CEN7	2.14	Private	2.73	shared	2.53	shared	2.66	shared	2.57	shared	4.16	0.244
V20CEN8	1.71	Private	1.91	Private	1.93	Private	1.94	Private	1.91	Private	3.88	0.275
V20CEN9	2.14	Private	2.55	shared	2.35	Private	2.38	Private	2.37	Private	1.62	0.654
V20CEN10	1.71	Private	2.09	Private	2.12	Private	2.22	Private	2.12	Private	5.14	0.162
V20CEN11	2.00	Private	1.45	Public	1.88	Private	1.78	Private	1.81	Private	2.63	0.452
V20CEN12	1.71	Private	1.73	Private	1.74	Private	1.66	Private	1.71	Private	0.70	0.873
V20CEN13	1.00	Public	1.00	Public	1.00	Public	1.00	Public	1.00	Public	0.00	1.000
V20CEN14	2.29	Private	2.27	Private	2.26	Private	2.34	Private	2.29	Private	0.70	0.873
V20CEN15	3.00	shared	2.82	shared	2.81	shared	2.72	shared	2.80	shared	3.05	0.384
V20CEN16	2.71	shared	2.91	shared	2.93	shared	2.94	shared	2.91	shared	3.88	0.275
V20CEN17	1.00	Public	1.36	Public	1.37	Public	1.56	Private	1.41	Public	3.05	0.384
L_{ii}: Contd'												
V20CEN18	2.00	Private	2.18	Private	2.19	Private	2.28	Private	2.20	Private	3.05	0.384
V20CEN19	2.29	Private	2.27	Private	2.26	Private	2.34	Private	2.29	Private	0.70	0.873
V20CEN20	2.57	shared	2.91	shared	2.70	shared	2.78	shared	2.74	shared	3.33	0.343
V20CEN21	2.57	shared	2.91	shared	2.70	shared	2.78	shared	2.74	shared	3.33	0.343
V20CEN22	2.29	Private	2.27	Private	2.26	Private	2.34	Private	2.29	Private	0.70	0.873
V20CEN23	2.29	Private	2.27	Private	2.26	Private	2.34	Private	2.29	Private	0.70	0.873
V20CEN24	2.29	Private	2.27	Private	2.51	Private	2.50	shared	2.46	Private	3.04	0.386
V20CEN25	2.00	Private	2.00	Private	2.00	Private	2.00	Private	2.00	Private	0.00	1.000
V20CEN26	2.86	shared	2.91	shared	2.91	Private	2.94	shared	2.91	shared	0.54	0.911
V20CEN27	2.00	Private	2.18	Private	2.19	Private	2.28	Private	2.20	Private	3.05	0.384
V20CEN28	2.57	shared	2.18	Private	2.40	Private	2.28	Private	2.34	Private	3.90	0.272
V20CEN29	2.43	Private	2.36	Private	2.35	Private	2.41	Private	2.38	Private	0.35	0.951
V20CEN30	2.43	Private	2.36	Private	2.35	Private	2.41	Private	2.38	Private	0.35	0.951
V20CEN31	2.43	Private	2.36	Private	2.35	Private	2.41	Private	2.38	Private	0.35	0.951
V20CEN32	2.14	Private	2.27	Private	2.28	Private	2.34	Private	2.29	Private	1.21	0.750
V20CEN33	2.14	Private	2.27	Private	2.28	Private	2.34	Private	2.29	Private	1.21	0.750

V20CEN34	1.71	Private	1.82	Private	2.07	Private	2.03	Private	2.00	Private	3.38	0.337
V20CEN35	2.43	Private	2.36	Private	2.35	Private	2.41	Private	2.38	Private	0.35	0.951
V20CEN36	3.00	shared	3.00	shared	3.00	shared	3.00	shared	3.00	shared	0.00	1.000
V20CEN37	2.00	Private	2.18	Private	2.19	Private	2.28	Private	2.20	Private	3.05	0.384
V20CEN38	2.86	shared	3.00	shared	2.77	shared	2.84	shared	2.83	shared	3.45	0.327
V20CEN39	3.00	shared	3.00	shared	3.00	shared	3.00	shared	3.00	shared	0.00	1.000
V20CEN40	2.86	shared	3.00	shared	2.77	shared	2.84	shared	2.83	shared	3.45	0.327
V20CEN41	2.86	shared	3.00	shared	2.77	shared	2.84	shared	2.83	shared	3.45	0.327
V20CEN42	2.71	shared	2.91	shared	2.93	shared	2.94	shared	2.91	shared	3.88	0.275
V20CEN43	2.00	Private	2.00	Private	2.00	Private	2.00	Private	2.00	Private	0.00	1.000
V20CEN44	2.43	Private	2.82	shared	2.60	shared	2.72	shared	2.66	shared	3.90	0.272

Appendix M: Anti-image Matrices for Exogenous risk factors

Anti-image Correlation		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Unstable government	.677														
2	Possible expropriation/ nationalization of assets	-.310	.607													
3	Poor public decision making process	-.534	.184	.519												
4	Strong political opposition/hostility	-.064	-.098	-.185	.688											
5	Inconsistencies in government policies	.062	.047	-.050	-.256	.753										
6	Poor financial market	.009	.021	-.204	-.320	-.013	.663									
7	Inflation rate volatility	.007	.123	-.266	-.137	-.448	.441	.638								
8	Interest rate volatility	.104	-.069	.035	.327	-.038	-.638	-.544	.670							
9	Exchange rate fluctuation	-.077	-.163	.204	-.134	.197	.056	-.251	-.206	.766						
10	Influential economic event(boom/recession)	-.261	.319	.284	-.046	-.162	-.240	-.041	.111	-.454	.743					
11	Legislation change/inconsistencies	-.079	-.274	.041	.100	-.171	-.183	-.211	.044	.078	-.006	.888				
12	Change in tax regulation	.020	-.309	.150	.327	.193	-.447	-.455	.276	.123	-.256	-.128	.752			
13	Corruption and lack of respect for law	-.368	.100	.001	.123	-.397	-.120	.168	.099	-.124	.203	.206	-.307	.670		
14	Import/Export restrictions	.042	.116	.325	-.468	.323	-.063	-.300	.003	.275	-.011	-.086	.045	-.400	.758	
15	Rate of returns restrictions	.193	-.212	-.280	-.084	-.314	.318	.313	-.022	-.063	-.093	-.120	-.281	.102	-.143	.737

Appendix M Cont'd: Anti-image Matrices for Exogenous risk factors

Anti-image Correlation		16	17	18	19	20	21	22	23	24
16	Industrial regulation change	.665								
17	Lack of tradition of private provision of public services	-.205	.540							
18	Public opposition to projects	.026	-.024	.662						
19	Non-involvement of host-community	.092	-.117	-.735	.680					
20	Cultural differences between main stakeholders	-.431	.180	-.237	-.061	.729				
21	Force majeure	-.406	.492	.067	-.145	.189	.596			
22	Weather	.259	-.314	-.092	-.020	-.059	-.465	.704		
23	Environment of the project	-.384	-.055	-.272	.233	.026	.016	-.441	.780	
24	Geotechnical conditions	-.093	-.331	.326	-.069	-.190	.032	-.143	-.053	.660

Appendix N: Anti-image Matrices for Endogenous risk factors

Anti-image Correlation		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Land acquisition/site availability	.855														
2	Level of demand for the project	-.283	.690													
3	Prolonged negotiation period prior to initiation	-.111	-.051	.657												
4	Competition risk	.171	-.516	-.291	.722											
5	Fault in tender specification	-.165	.119	-.306	-.082	.860										
6	Availability of finance	-.130	.326	-.059	-.233	.091	.747									
7	High finance cost	-.059	.092	.138	-.055	-.250	.080	.802								
8	Lack of creditworthiness	.059	-.317	.168	.062	.161	-.349	-.469	.625							
9	Liquidity	.091	.094	-.145	.263	-.082	-.216	.200	-.413	.784						
10	Depository	-.148	.000	.264	-.225	-.215	.028	-.181	.152	-.315	.881					
11	High bidding costs	-.027	-.244	-.217	.022	.344	-.239	-.390	.282	-.133	-.185	.777				
12	Inability to service debt	-.372	.555	-.017	-.257	.004	.434	.319	-.501	-.001	-.028	-.436	.671			
13	Lack of government guarantees	.161	-.399	.138	.134	-.284	-.122	-.080	.248	-.354	.059	-.168	-.280	.822		
14	Bankruptcy of concessionaire	.192	-.414	-.117	.210	.151	-.276	-.285	.463	-.498	.038	.370	-.515	.214	.715	
15	Financial attraction of project to investors	-.057	-.028	-.204	.066	-.175	.169	.139	-.484	.286	-.137	-.091	.158	-.005	-.395	.717

Appendix N Cont'd: Anti-image Matrices for Endogenous risk factors

Anti-image Correlation		16	17	18	19	20	21	22	23	24
16	Residual value (after concession period)	.642								
17	Delay in project approvals and permits	-.543	.844							
18	Design deficiency	-.305	.011	.774						
19	Unproven engineering techniques	.323	-.147	-.593	.748					
20	Construction cost overrun	.040	-.164	-.003	-.172	.775				
21	Construction time overrun	-.275	.408	-.027	-.055	-.377	.578			
22	Availability of appropriate labour/material	-.024	-.089	.037	-.183	.185	-.350	.552		
23	Manpower problem associated with trade unions	.121	.062	-.528	.266	-.246	.016	-.383	.743	
24	Late design changes	.091	-.100	-.252	-.115	-.109	.359	-.192	.206	.796

Appendix O: Anti-image Matrices for Endogenous risk factors

Anti-image Correlation		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Poor quality of workmanship	.868														
2	Excessive contract variation	-.068	.806													
3	Insolvency/default of subcontractors and suppliers	-.025	-.549	.802												
4	Risk regarding pricing of product/service	.199	.005	-.244	.849											
5	Operational revenue below projection	-.375	.158	-.302	-.256	.823										
6	Operation cost overrun	.157	-.078	.263	-.111	-.403	.744									
7	Low operating productivity	-.120	.216	-.154	.141	.107	-.428	.771								
8	Maintenance more frequent than expected	-.254	-.208	.140	-.317	-.288	.275	-.089	.815							
9	Maintenance cost higher than expected	-.085	-.033	.079	-.021	.182	-.319	.512	-.305	.670						
10	Life of facility shorter than anticipated	-.171	-.088	-.099	-.056	.009	-.183	-.428	.099	-.208	.864					
11	Inadequate experience in PPP	-.329	.030	.169	-.053	.222	-.173	-.018	-.293	-.103	-.179	.830				
12	Organization and coordination risk	.062	.009	-.126	.054	-.046	-.002	-.079	-.034	.093	-.216	-.173	.899			
13	Lack of commitment from public / private partner	.337	-.287	.017	.048	-.119	.005	-.117	.070	.031	.037	-.429	-.179	.841		
14	Inadequate distribution of authority between partner	-.153	.325	-.047	.065	.010	.070	-.096	-.070	-.338	.016	.291	-.279	-.326	.642	

15	Different working methods/know-how between partners	.051	-.152	.003	-.053	-.134	.109	.040	.306	-.036	-.087	.010	.117	.009	-.549	.666

Appendix O: Anti-image Matrices for Endogenous risk factors

Anti-image Correlation		16	17	18
16	Counter party's creditworthiness	.788		
17	Staff crises	-.096	.746	
18	Third party tort liability	-.118	-.677	.730

Appendix P: loading of each factor under the exogenous risk factors

Rotated Component Matrix[a]

Variables	Component						
	1	2	3	4	5	6	7
Weather	.8282	.0968	.2570	-.0061	.0260	.0688	.1026
Geotechnical conditions	.8000	-.0219	-.0633	.3177	-.0188	-.0476	-.1174
Environment of the project	.7928	.1602	.1637	.0568	.0217	.3280	.1445
Industrial regulation change	.7111	.1505	.1077	.1942	.3128	-.0470	.1663
Cultural differences between main stakeholders	.6458	.2413	.3209	-.2762	.1124	.2502	-.1854
Rate of returns restrictions	.5968	-.1061	.2249	.3508	.2683	-.0728	.3891
Exchange rate fluctuation	.1733	.8739	.0593	-.0725	.0040	-.1010	.1096
Influential economic event(boom/recession)	.1569	.8518	.0841	.2375	-.1154	-.0327	.0405
Interest rate volatility	-.0269	.7996	.1387	.0270	.3198	.2798	.1056
Inflation rate volatility	.0065	.7751	.1432	.2449	.3588	.2722	.0275
Non-involvement of host-community	.0974	.2283	.8832	.1913	.1630	.0529	-.0647
Public opposition to projects	.4814	.0671	.8214	.0341	-.0221	.0708	.0439
Inconsistencies in government policies	.1495	.3431	.0951	.8321	.0832	.2070	.1248
Strong political opposition/hostility	.2717	.0320	.2203	.6868	-.4269	.2421	-.0813
Lack of tradition of private provision of public services	.2988	.2245	.1424	-.0970	.8105	-.0466	.0435
Poor public decision making process	.1568	.1059	.0717	.2433	-.0614	.9005	.0126
Possible expropriation/ nationalization of assets	.1047	.1945	-.0522	.0302	.0384	.0262	.9330

Extraction method: Principal Component Analysis
Rotation Method: Varimax with Kaiser Normalisation
a. Rotation converged in 8 iterations.

Appendix Q: loading of each factor under the endogenous risk factors

Rotated Component Matrix[a]

Variables	Component				
	1	2	3	4	5
Liquidity	.8040	.0515	.2022	.1688	.3310
Lack of government guarantees	.7485	.1801	.0908	-.0052	.3751
High bidding costs	.6877	.4842	.0616	.3501	-.0150
Depository	.6726	.5553	.2202	.0017	.0077
Inability to service debt	.6430	-.0934	.0806	.4911	.3440
High finance cost	.5736	.4358	.2207	-.0072	.3261
Bankruptcy of concessionaire	.5679	.0678	.2867	.5005	.2110
Competition risk	.1057	.8808	.1579	.0349	-.1119
Prolonged negotiation period prior to initiation	.0007	.6947	-.1465	.3002	.3616
Level of demand for the project	.2257	.6898	.1317	.1659	.2287
Manpower problem associated with trade unions	.2242	.5722	.4869	.2219	-.2033
Unproven engineering techniques	.2008	-.0640	.8262	.2943	.2015
Design deficiency	-.0219	.2256	.7844	.3300	.3368
Late design changes	.4427	.1819	.6024	.1434	.1413
Fault in tender specification	.1884	.4642	.5523	.1248	.1867
Residual value (after concession period)	-.0504	.2108	.1776	.8349	-.0253
Financial attraction of project to investors	.2000	.1545	.2864	.6777	.0947
Delay in project approvals and permits	.3479	.1781	.2723	.6238	.2884
Construction cost overrun	.1829	.0819	.2115	.1642	.7703
Availability of finance	.3987	.1710	.1268	-.1209	.7614
Lack of creditworthiness	.2905	-.0388	.2512	.3103	.6893

Extraction method: Principal Component Analysis
Rotation Method: Varimax with Kaiser Normalisation
a. Rotation converged in 11 iterations.

Appendix R: loading of each factor under the endogenous risk factors

Rotated Component Matrix[a]

Variables	Component			
	1	2	3	4
Low operating productivity	.8779	.1549	.0843	-.1990
Life of facility shorter than anticipated	.8419	.2802	-.0048	.1728
Operation cost overrun	.8286	-.0804	-.0837	.2089
Organization and coordination risk	.7411	.1781	.2855	-.0242
Inadequate experience in PPP	.6999	.3378	-.0585	.4191
Lack of commitment from public / private partner	.6253	.2655	.4351	.0972
Excessive contract variation	.1425	.8421	.1319	.0387
Risk regarding pricing of product/service	.1497	.8158	-.0398	.2334
Third party tort liability	.1279	.7497	.1667	.1511
Insolvency/default of subcontractors and suppliers	.2156	.7437	.3409	-.2058
Maintenance more frequent than expected	.2620	.6813	-.2307	.4879
Different working methods/know-how between partners	-.0281	.0020	.9068	.0028
Inadequate distribution of authority between partner	.2010	.0500	.8369	.1945
Counter party's creditworthiness	.0460	.4764	.6496	.0145
Maintenance cost higher than expected	.1169	.1852	.2698	.8783

Extraction method: Principal Component Analysis
Rotation Method: Varimax with Kaiser Normalisation
a. Rotation converged in 6 iterations.

Appendix S

Instrument for Framework Validation

SECTION A: Background Information on the respondent

1. Name of organization
(optional)…….....

2. Type of Establishment: Consulting ☐ Contracting ☐ Banking ☐
Concessionaire ☐ Academia ☐ Others specify…….

3. Academic Qualification: HND ☐ B.Tech/BSc ☐ M.Tech ☐ PhD ☐

4. Profession: Quantity Surveying ☐ Architecture ☐ Engineering ☐
Building ☐ Banker ☐ others (specify)…….....
.....

5. Years in Service: 1-5 ☐ 6-10 ☐ 11-20 ☐ 21-30 ☐ > 30 ☐

6. Designation of Respondent in the establishment: Chief Executive/Managing Director ☐
Project Manager ☐ Financial Adviser ☐ Facilities Manager ☐ Cost Adviser ☐
Architect ☐ Engineer ☐ Project Officer ☐ others (specify)
.....

7. Professional qualification:	NIQS	COREN	NIA	NIOB	OTHERS
Graduate member					
Corporate member					
Fellow member					

8. Have you been involved in any project executed under public-private partnership arrangement? Yes ☐ No ☐

9. If 'Yes', how many? 1-5 ☐ 6-10 ☐ 11-15 ☐ 16-20 ☐ 21-25 ☐
> 26 ☐

SECTION B: Framework Validation

10. Please tick kindly (√) as appropriate to indicate your overall assessment of the framework in terms of the following specific statement using the scale

Excellent	Above Average	Average	Below Average	Extremely Poor
5	4	3	2	1

Framework Assessment Statements (FAS)	Rating				
	5	4	3	2	1
Logical structure of the framework					
Clarity of the framework					
Comprehensiveness of the framework					
Practical relevance to Risk management concept in PPP project					
Applicability in Construction Project Management					

11. Please kindly identify the limitations/weakness (if any) of the framework

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12. Please kindly identify other potential applications of the model in the management of construction projects

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13. Please kindly give any general comments that you may have on the framework

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Thanks for your time and your useful contributions