

# **IMPROVING FINANCIAL RISK MANAGEMENT IN THE PETROLEUM INDUSTRY OF NIGERIA**

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## DECLARATION

I, Christiana Ogulu (210268069), hereby declare that the thesis for Doctor in Business Administration is my own work and that it has not previously been submitted for assessment or completion of any postgraduate qualification to another university or for another qualification.

A handwritten signature in black ink, appearing to read 'Christiana Ogulu', is written over a light yellow rectangular highlight. Below the signature is a horizontal dotted line.

Christiana Ogulu

## **DEDICATION**

This work is dedicated to my family, late Prof Azibakene Ogulu, my children, Debi, Ekparimu, Ubiebo and Dainamiaro Ogulu, and my parents, Late Cooke Anitor and Vidah Anitor.

## **ABSTRACT**

Petroleum companies are critical to the Nigerian economy, as the petroleum sector is the biggest earner and spender of foreign exchange and the highest employer of labour. The industry is however faced with challenges of unprecedented fluctuation of commodity prices, exchange rates, a series of divestments, host communities' demands, oil theft, project shelving, and destruction of infrastructure. Workforce cutting and consolidations are also the order of the day and current financial risk management (FRM) systems in companies appear not to be working.

FRM systems in Nigerian petroleum companies have failed because risk managers did not have one generally accepted framework to manage financial risks such as fluctuations in commodity prices, exchange rates, interest rates, and in the demand and supply of crude oil and gas. There was a need for an integrated framework that is more descriptive and that does not rely only on mathematical models, separate management of each financial risk, and specific focus on the downside risk and derivatives.

Mathematical models have presented weaknesses in the identification of issues, dissemination of information, policy formulation, planning, type and the institution of risk culture or delimitation of authority and in responsibility through the organisational structure. Mathematical models could not fully reduce the identification, communication, structure, and environmental scanning of FRM to mathematical models.

The present study was the first attempt at an FRM framework that integrated all the financial risks strategically and took into consideration all the critical success factors that can solve the problems and challenges facing the Nigerian petroleum companies in the long term. The primary objective of the study was therefore to develop an FRM framework for the petroleum industry of Nigeria.

The study collected data using a mixed methods approach to generate quantitative and qualitative data regarding financial risks facing the petroleum industry and

possible methods of managing these risks effectively. The final sample consisted of 70 top-, middle- and lower-level managers, as well as five experts in the industry. Questionnaires were administered to practitioners in the south-eastern and south-western regions of Nigeria, and semi-structured interviews were conducted with financial risk management experts in the petroleum industry. Descriptive and inferential statistics were used in analysing the data.

The study succeeded in developing a framework that:

- provides a thorough understanding and proper evaluation of the most important financial risks petroleum companies face;
- identifies the type and extent of top management support needed in a strategic FRM system;
- identifies and operationalises the financial risk culture that should be fostered to achieve FRM success;
- identifies the organisational structure that supports the successful achievement of FRM;
- identifies and operationalises the organisation communication flow that supports the successful achievement of FRM;
- identifies and operationalises oversight and control to support the successful achievement of FRM; and
- specifies the amount of training that supports the successful achievement of FRM.

By implementing this framework, petroleum organisations in Nigeria will go a long way in successfully managing financial risks in that industry.

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## GLOSSARY

CBN	Central Bank of Nigeria
CIMA	Chartered Institute of Management Accounting
CNBC	Consumer News and Business Channel
COSO	Committee of Sponsoring Organizations of the Treadway Commission
EIA	Energy Information Administration
ERM	Enterprise Risk Management
FRM	Financial Risk Management
IMF	The International Monetary Fund
NNPC	Nigeria National Petroleum Corporation
NYSE	New York Stock Exchange
OPEC	Organisation of Petroleum Exporting Countries
ORM	Operational Risk Management
PRMA	Public Risk Management Association
SRM	Strategic Risk Management
SWOT	Strengths, Weaknesses, Opportunities and Threats
USA	United State of America
EIA	The United States Energy Information Administration

## CHAPTER 1

### THE SCOPE OF THE STUDY

#### 1.1 INTRODUCTION

Financial risk management (FRM) is the process of appraising market risks with financial implications, which involves identifying, evaluating, planning, communicating, mitigating and reviewing these risks to limit their negative impact and to take up the opportunities that arise (Chartered Institute of Management Accounting [CIMA] 2008: 4). In the last decade (2006 to 2016), the worldwide petroleum financial market has been volatile, with large swings in commodity prices, foreign exchange rates, interest rates, stock prices, and in the demand and supply of petroleum products in addition to complex instrument for limiting these risks (BDO, 2016: 2). The recurring nature of price risk in the petroleum industry suggests that uncertainty, driven by oil and gas price changeability, causes continuous anxiety to all stakeholders. This anxiety needs to be managed for the survival of companies in the industry (Talbot, Artiach & Faff, 2013: 1).

Financial risks in the petroleum industry are linked to the changing demand and supply of petroleum products, foreign exchange, pricing of petroleum products, interest rates, share prices, and finally economic and regulatory risks (Eni, 2013: 90–99). Since the operations of petroleum companies are linked to international economies, lifestyles, and regulations of various governments and institutions, these companies need to manage financial risks for survival (Eni, 2013: 90). The petroleum industry of Nigeria

– which is the focus of this study – depends on being able to manage the several financial risks that are common to its operations (Shell, 2013: 7).

A petroleum industry is made up of two divisions known as “streams”. These streams are labelled as upstreams and downstreams. The upstream division is dominated by those whose activities are concerned with the exploration and development of oil fields and transportation, while the downstream is concerned with refining and sales of products (Enyinda, Briggs, Obuah & Mbah, 2011: 38). The importance of an integrated FRM framework, which incorporates both streams, has again been highlighted by the 2008 financial crisis. The latter crisis is still having an impact on companies, individuals and economies in 2017. The need to further study ways to improve the FRM system in the Nigerian petroleum industry has become critical “in view of the fact that risk management was still at its rudimentary stage” in Nigeria in 2012 (Dabari & Saidin, 2014: 627).

According to the Central Bank of Nigeria (CBN, 2012: 2), there is a severe shortage of expert risk professionals in Nigeria, while company board members have poor risk management knowledge. Nigeria also lacks formal training institutions offering risk management curricula, which has resulted in many unqualified practitioners in the risk management field. Additionally, those who manage financial risks have no power to influence the strategic direction of decisions taken by oil organisations owing to a lack of understanding or inclusion of such professionals in strategy decision-making committees (KPMG, 2011: 6). Even the CBN risk management guidelines are based on the management of each individual financial risk, instead of an integrated risk

management framework or guideline (CBN, 2007: 5–15). Zuofa Ochieng (2014: 369) identifies the lack of personnel with risk management knowledge and incompetent team formation as being among key issues currently affecting project risk management practice in the Nigerian oil and gas industry.

This study investigates what the nature of a FRM framework should be that would be able to contribute to the longevity of petroleum companies operating in the Nigerian industry. This study is an attempt to mitigate financial risks facing the petroleum companies operating in Nigeria, through the development of an FRM framework that is descriptive and easy to understand.

## **1.2 THE PROBLEM STATEMENT**

The 2008 global financial crisis brought to the fore the need for an integrated FRM framework in all companies (Landsberg, 2011: 5). The contagion caused by this crisis created a worldwide effect that countries and organisations are still suffering from. FRM procedures were subsequently scrutinised more intensely by the internal and external stakeholders of companies, which led to re-assessment of the numbers-driven culture in FRM processes and procedures (Mikes, 2009: 18). Furthermore, the absence of communication between various units of the organisations, in other words the silo mentality in the management of financial risks, was also increasingly questioned (Mikes, 2011: 227). The realisation dawned that FRM should be a system or framework of interrelated activities, involving humans, processes and technology instead of just precision of prediction and calculation (Millo & Mackenzie, 2009: 639).

FRM frameworks or systems have also been discussed as consecutive steps that need to be taken to manage financial risks in companies. These steps often do not elaborate on precisely what the content of each step is supposed to be. In other words, the focus on structures, success factors and other determinants of effective FRM has often been lacking in FRM frameworks. For example, the Chartered Institute of Management Accounting (CIMA, 2008: 7) suggests the following eight steps for managing financial risk:

- establishing a management group and goals;
- identifying risk areas;
- understanding and assessing the scale of risk;
- developing a risk response strategy;
- implementing of the strategy and allocation of responsibilities;
- implementing and monitoring control;
- reviewing and refining the process; and
- gathering/storing/disseminating information for decision-making.

Frigo and Anderson (2011: 2) propose the following six steps for SRM:

- an assessment of organisation effort in SRM;
- environmental assessment of strategic risks;
- identification of strategic risks;
- measurement of strategic risks;
- monitoring strategic risks; and
- continuous development of SRM.

Questions, for example, that remain unanswered in the above-mentioned theoretical steps is what risks are of particular concern to the petroleum industry, what is the scale of these risks, what variables should be a key focus in the risk response strategy, and what type of oversight and control is needed to support the successful achievement of FRM in the petroleum industry. The present study attempts to answer these questions as they pertain to the petroleum industry of Nigeria.

Before the global financial crisis, the management of financial risk in companies was spread in an unintegrated fashion over other internal organisation frameworks, such as those addressing operational risk management (ORM), enterprise risk management (ERM) and strategic risk management (SRM) (Bodla & Verma, 2008: 63; Frigo & Anderson, 2011: 2; Zuofa & Ochieng, 2014: 369). The need for a framework that brings together all elements of concern for FRM began to emerge.

FRM is seen by modern organisations, practitioners and academics as an important managerial function for the sustainability and longevity of companies (Millo & Mackenzie, 2009: 639; Hammoudeh & McAleer, 2015: 109; Landsberg, 2011: 1). However, the acceptable procedure of management is said to be evolving (Landsberg, 2011: 9; Dionne & Triki, 2013) and this movement is said to have originated from insurance and financial institutions.

Traditionally, risk management was done on an individual basis, such as commodity, interest rate, exchange rate, credit and liquidity (Kim & Park, 2014: 634). As noted

above, even the CBN guideline for an FRM framework is on an individual risk basis (CBN, 2007: 1).

Risk management was also done quantitatively, as shown by various recent research studies in FRM that focus on mathematical models (Asai, Caporin & McAleer, 2015: 40–50; Gonzalez-Perez, 2015: 149–159). Financial risks were viewed only as downside (negative) risk only (Hoyt & Liebenberg, 2011: 795; Fadun, 2012; Dabari & Saidin, 2014). Focus was mostly on the use of derivatives for the solving of financial risk problems (Rossi, 2013: 415; Hammoudeh & McAleer, 2012: 109; Kozarevic, Jukan, & Civic, 2014:39).

The growth and complication that ensued in the development of derivatives (from simple to exotic) created problems for managers (Committee of Sponsoring Organisations of the Treadway Commission [COSO], 2004: 1). Companies in Nigeria are generally struggling with implementing effective ERM frameworks (CBN, 2012: 2). Not many companies in Nigeria have even adopted an ERM framework as a way of managing risk (Fadun, 2013: 69). The implementation of these frameworks is at a rudimentary stage, riddled with many challenges (CBN, 2012: 2). These challenges include a lack of training institutes, lack of risk management knowledge among board members, shortage of professional risk experts, and a lack of capacity development through staffing and training of proficient risk specialists.



Petroleum companies are critical to the Nigerian economy. This industry is the biggest earner and spender of foreign exchange, and is the highest employer of labour in a country with a high unemployment rate (Akinlo, 2012: 165; CBN, 2015: 28).

The industry, however, faces challenges such as unprecedented fluctuation of commodity prices, exchange rates, a series of divestments, host communities' demands, oil theft, project-shelving, and destruction of infrastructure (Ramos & Veiga, 2011: 525; Shell, 2012: 1–2; Shell, 2013: 7; Reuters, 2013). The current risk management systems in these companies appear not to be working (Fadun, 2013: 70; Schroeder & Jackson, 2007: 1).

The findings of Zuofa and Ochieng (2014: 371) indicate that there is a poor understanding of the various risks inherent within the oil and gas industry projects, as their risk managers' opinions of risk and risk management differ considerably. Risk management is done in the industry on a solus basis, relying on mathematical models with a narrow focus on the threats, and forgetting the principal of integration for effectiveness (Fadun, 2013: 69). Zuofa and Ochieng (2014: 372) suggest that the frequency of training on risk management should be increased for the improvement of risk management knowledge in the petroleum industry of Nigeria.

Literature suggests that risk management systems in companies fail for various reasons. In the first place, there is not a generally accepted definition of risk. This obstructs the standardisation, appraisal and handling of FRM (Renn & Klinke, 2004: 1; Kallman & Maric, 2004: 58). Secondly, risk management does not have one generally accepted framework to which managers of financial risk can refer for

techniques and approaches. This is particularly problematic for companies that do not operate in the financial sector, such as petroleum companies in Nigeria (Merna & Al-Thani, 2008: 44; Fadun, 2012: 227). KPMG (2008: 2) suggests that FRM failed for a number of reasons, including that risks are managed individually although their effects are interconnected, and the use of static mathematical models. These mathematical models rely solely on historical data, focusing on narrow measures, overlooking known and unknown risks, failing to communicate, and are not being managed in real time (Stulz, 2009: 89–93).

An example of a different risk framework is the ERM framework of COSO (2004: 1–16), which suggests the following eight steps to manage risk:

- assessment of the internal environment;
- objective-setting;
- identification of exposure;
- evaluation of exposure;
- selection of treatments;
- implementation of treatments;
- monitoring the process; and
- communication and information. (Committee of Sponsoring Organizations of the Treadway Commission [COSO], 2004: 1–16).

Other risk management systems are industry-specific. For example, Fernandes, Barbosa-Povoa and Relvas (2010: 157–162) ERM framework focuses on supply chain

risk management in oil industry; Dabari and Saidin (2014: 72) address ERM in Nigeria's banking industry; Cho, Ahn, Jeung and Kim (2010: 44–52) focus on risk management in engineering companies; and Zuofa and Ochieng (2014: 369–374) discuss project risk management in Nigerian petroleum companies.

Finally, the literature establishes that risk management research in Nigeria has been mostly focused only on ERM (Donwa & Garuba, 2011, Owojori, Akintoye & Adidu, 2011, Njogo, 2012, Ugwuanyi & Ibe, 2012, and Fadun, 2013).

In terms of this literature review, it appears that the main problem in managing financial risk is the lack of an integrated framework which is descriptive and which does not rely only on mathematical models, separate management of each financial risk, or on specific focus on the downside risk and derivatives. This need for integration is clear from the FRM financial model studies of Chang, McAleer and Tansuchat (2011), Lutz (2013), Dionne and Triki (2013), and Caporin and Paruolo (2015).

Mathematical models have not been able to help in the identification of issues, dissemination of information, policy formulation, planning, in the institution of risk culture, or with the delimitation of authority and responsibility through the organisational structure (Huber & Scheytt, 2013: 94). It has been impossible to put some aspects of risk management into meaningful mathematical models that are standardised and normalised. As Huber and Scheytt (2013: 94) confirm, it has been impossible to fully reduce the identification, communication, structure, and environmental scanning of FRM to mathematical models.

The present study asserts that only an FRM system which integrates all financial risks strategically, and which takes into consideration all critical success factors, can solve the problems and challenges facing Nigerian petroleum companies, both currently and in the long term. In pursuit of an integrated FRM framework, the study supports the following principles:

- that risk managers should view FRM in terms of assessing manageable factors instead of calculative, quantifiable, or measurable concepts (Millo & Mackenzie, 2007: 2);
- that the petroleum industry of Nigeria demands a framework that allows companies to nurture and advance decision-making processes, instead of handling each financial risk decision individually (Horcher, 2005: 178);
- that an organisational structure enabling the flow of information in the organisation through lines of authority, responsibility and accountability, is preferred in order to achieve such integration (Landsberg, 2011: 8); and
- that more than mathematical models, FRM frameworks must include sustainable success factors such as organisational culture, organisational structure and top management support (Yaraghi & Langhe, 2011: 576–577).

In an attempt to address the lack of an integrated framework which is descriptive and which does not rely only on mathematical models, separate management of each financial risk, or on specific focus on the downside risk and derivatives a proposed integrated FRM framework for Nigeria's petroleum industry is discussed in the next section.

### **1.3 TOWARDS AN INTEGRATED FRM FOR NIGERIA'S PETROLEUM INDUSTRY**

As a result of the lack of literature on strategic FRM frameworks in the empirical studies, this study has borrowed from ERM, ORM, and SRM to develop the conceptual framework for this study. The COSO (2004) ERM generic framework consists of risk management policies and processes that cover risk identification, acceptance, measurement, monitoring, reporting and control. When adopted, however, it could not succeed unless it operated in the presence of certain critical success factors. Rochart (1979: 87) defines critical success factors as the necessary elements that are vital to the success of a particular organisation during a planning period. Accordingly, FRM success is measured in this study as the success that companies have achieved with their methods of managing financial risk; in other words, how successful the companies were in (1) developing policy frameworks to manage financial risks, (2) identifying financial risks, (3) analysing FRM; (4) mitigating financial risks; and (5) communicating and controlling financial risks.

In developing the framework, independent variables that had been identified and suggested by previous researchers will be combined with new variables to form the critical success factors for the present study. In order for an FRM system to be successful, these independent variables must be present to create value and protect value. Geisel's (2008:1) findings from risk practitioners indicate that value protection and creation can only take place in the presence of senior management support. The administrative board should support the ERM system, which should be integrated into the business plan and strategy. Speculand (2007:4) conducted a five-year survey

across South East Asia and found that the sustainable dimensional elements of ERM are people, processes, communication, culture, reinforcements and reviews. An empirical investigation of critical success factors for risk management systems by Yaraghi and Langhe (2011: 576–577) found the following to be critical for ERM:

- strategy,
- organisational culture,
- structure, and
- support of top management.

Zhao, Hwang and Low's (2013:1199) results show that the most critical success factors that drive ERM in Chinese construction companies are:

- execution and integration;
- communication and understanding; and
- commitment and involvement of top management.

Landsberg (2011:7–8) suggests that a risk management system should comprise these critical factors:

- Link risk to strategy;
- Risk-aware culture;
- Organisational structure;
- Link rewards to performance;
- Internalising of communication, and
- Information technology infrastructure

Based on the above discussion, the proposed critical success factors to be investigated in this study are detailed in the table below.

Table 1.1: Proposed critical success factors

<b>Dependent variable</b>	<b>Independent variables</b>
FRM success	Top management support
	Corporate culture
	Communication
	Information technology
	Organisational structure
	Training and development
	Oversight and control

#### **1.4 IMPORTANCE OF THE STUDY**

The researcher of the present study suggests that it is important to conduct this study, in order to realise important benefits for the Nigerian petroleum industry. The benefits of a sustainable FRM framework are as follows:

- improvements in decision-making, effective strategies, and operational tactics, compliance with all rules and regulations to increase value for stakeholders (Public Risk Management Association [PRMA], 2010: 2; Arnold, Benford, Canada & Sutton, 2011: 171);
- enhancement of the reputation of petroleum industry companies, as they are seen and viewed as being proficient, trustworthy and successful (CIMA, 2008: 7);
- a well-planned process of identifying, scheduling, analysing, ranking, communicating, mitigating and controlling risks (Thomson Reuters, 2014: 1);

- promotion of the understanding of risk facing an organisation, which improves competence, reduces expense, and emphasises the attainment of the organisation's objectives;
- addition of value when FRM is connected to objectives and strategies (COSO, 2004: 1);
- advancement of organisational value and governance (DeLoach & Thomson, 2014: 1);
- better understanding of financial risks, and the anticipation, management and monitoring of new developments for value creation (Rogachev, 2008: 76);
- enabling the oil sector to be effective in dealing with risks, to be competitive and profitable for sustainability (Baxter, Bedard, Hoitash & Yezegel, 2013: 1266);  
and
- improvement of FRM culture, communication, capacity building and reinforcement.

## **1.5 RESEARCH QUESTIONS**

In pursuit of a sustainable FRM framework as detailed above, this study seeks to address the following broad research questions:

- 1) What are the financial risk factors in the petroleum industry of Nigeria?
- 2) What is the impact of financial risks on petroleum organisations in Nigeria?
- 3) What are the challenges in FRM that petroleum organisations encounter in Nigeria?



- 4) What are the critical factors needed for the success of FRM in the petroleum industry in Nigeria?
- 5) Do upstream and downstream petroleum organisations differ with regard to their evaluation of FRM issues in the petroleum industry in Nigeria?
- 6) What would be an effective strategic FRM framework for petroleum organisations in Nigeria?

## **1.6 RESEARCH OBJECTIVES**

The primary research objective of this study is to develop an FRM framework for the petroleum industry of Nigeria.

In order to achieve this primary objective, the following secondary objectives have been formulated:

- Objective 1: to examine the nature of financial risks in the petroleum industry in Nigeria;
- Objective 2: to explore the impact of financial risks on the industry;
- Objective 3: to examine the challenges faced by companies in the sector in managing financial risks;
- Objective 4: to analyse the critical success factors of an FRM system in the industry;

Objective 5: to determine if upstream and downstream organisations differ with regard to their evaluation of FRM issues in the petroleum industry in Nigeria; and

Objective 6: to develop an improved sustainable framework for FRM for companies in the petroleum industry.

## **1.7 THE RESEARCH HYPOTHESES**

In order to achieve Objective 4, namely, to analyse the critical success factors of an FRM system in the industry, the following hypotheses have been formulated, leading to the proposition as stated:

Hypothesis 1: Top management support is positively related to FRM success in Nigerian petroleum organisations.

Hypothesis 2: An FRM-supporting culture is positively related to FRM success in Nigerian petroleum organisations.

Hypothesis 3: An FRM-supporting communication flow is positively related to FRM success in Nigerian petroleum organisations.

Hypothesis 4: FRM-supporting information technology is positively related to FRM success in Nigerian petroleum organisations.

Hypothesis 5: A centralised organisational structure is negatively related to FRM success in Nigerian petroleum organisations.

Hypothesis 6: FRM-frequency of supporting training and development is positively related to FRM success in Nigerian petroleum organisations.

Proposition1: Proper FRM oversight and control measures in Nigerian petroleum organisations save these organisations from selected risk consequences.

## **1.8 METHODOLOGY OF THE STUDY**

This study utilised a mixed method research with the philosophical stand that is associated with the pragmatism paradigm (Harrison, 2013: 2153). Therefore, the worldview chosen for this study was drawn from the pragmatism worldview, leading to the use of a mixed methods research design. Both qualitative data and quantitative data were collected via the use of semi-structured interviews and questionnaires respectively. This involves delivering questionnaires by hand to most respondents; only those who insisted that mail be send to them were e-mailed. Mixed method research means that the study used two instruments for data gathering, two methods of data analysis, and then integrated the results and implications drawn from both of these methods.

The quantitative data analyses involved:

- the calculation of Cronbach alphas to ascertain the internal consistency reliability of the data;
- exploratory factor analyses to evaluate the construct (more particularly, the discriminant) validity of the data;
- the calculation of descriptive statistics to investigate the perceptions of respondents on various aspects pertaining to FRM;
- the calculation of two-sample t-tests to investigate whether upstream and downstream sectors of the petroleum industry differ significantly with regard to various aspects of FRM;
- multiple regression analyses to investigate which latent variables are the most important factors influencing FRM success; and
- the calculation of Pearson correlations to investigate additional factors that might influence FRM success.

In the present study, the first four variables detailed in Table 1.1 (top management support, FRM culture, communication flow and information technology) were measured as latent variables, while the remaining three (organisational structure and training and development and oversight and control) were measured as nominal variables). To predict an outcome from more variables, the study utilised multiple regression analyses (Collis & Hussey, 2014). To test for association between two quantitative variables, Pearson's correlations, factor analysis and reliability tests were utilised in this study.

The qualitative data analyses included the content analysis of semi-structured interviews and documentary evidence from various organisation websites and industry reports in the public domain. Five expert practitioners from the Nigerian petroleum industry were also interviewed. These experts are top management staff who are knowledgeable in financial risk management, with at least three years of practical experience at the time of the interviews.

The study population included the entire financial risk management practitioner in management level of oil companies operating in the south of Nigeria who operate both in the downstream and upstream sectors of the business. The downstream sector of the petroleum industry are those companies involved in refining and distribution, while the upstream sector are companies involved in exploration and extraction.

To be selected for the sample, the target respondent had to conform to the following characteristics:

- must be a person working in the petroleum sector;
- must be knowledgeable in risk management and practice;
- must be in the upper, middle or lower level of management; and
- an expert must be in the top level of management.

The study relied on the membership list of the Association of Senior Staff of the Petroleum Industry of Nigeria, to identify the abovementioned participants. In this way, 130 potential individuals were identified as constituting the sampling frame for this study. A convenience sample of 98 individuals was targeted in the sampling frame and

questionnaires were distributed to 98 potential participants. Only 70 respondents eventually participated, which translated to a 71% response rate.

## **1.9 TERMINOLOGY**

Some key terminology used in this study is explained in the following paragraphs.

- Risk

As it stands today, there is no universally acceptable definition of the term “risk”. One extreme opinion is the constructivist view that regards risk as a perception issue, while the other extreme holds the positivist view that risk can be measured through probability (Holton, 2004: 24; Ganegoda & Evans, 2014: 38). Holton (2004: 22) defines risk as an “exposure to a proposition of which one is uncertain”. Holton, added that risk exists only in presence of uncertainty and usefulness for the enterprise. Risk in finances is defined in terms of the changeability of actual return when compared to the predetermined return (Damodaran, 2008: 7; Gitman & Zutter, 2012: 808). Therefore risk in the petroleum industry of Nigeria is the uncertainty surrounding the financial outcome of everyday business undertakings which may positively or negatively impact on the finance of the business. Financial risk in the context of this study, is regarded as the uncertainty in the movement of foreign exchange rates, commodity prices and interest rates in response to demand and supply,

- Management

Management is the process of planning, organising, leading and controlling business activities in order to achieve defined objectives (Du Toit, Erasmus & Strydom, 2010: 172). Management is a set of decisions and activities that determine the long-run effective performance of an organisation (Wheelen & Hunger, 2006:4). Management is the process of planning, organising, leading, and controlling of an organisation by the management (Nieman & Nieuwenhuizen, 2014: 13). The management process ensures that an organisation is able to operate in both the immediate and near future, and it gives direction to employees. In the context of this study, management is the process of appraising petroleum industry financial risks, opportunities, threats, strengths and weaknesses, with the aim of identifying, evaluating, planning, communicating, mitigating and reviewing the FRM process to determine the lesson learnt. It involves the setting of frameworks and policies with the support of top management, and change to risk awareness culture, organisational structure, effective communication, reward system and education.

- Finance

Finance is the lifeblood of every business; it is the fund that helps organisations accept net present value investment. Finance can also be said to be the discipline of money administration (Pike & Neale, 2006: 800). Finance refers to how an organisation generates and employs money and credit in business to carry out their operations effectively and efficiently (Nieman & Nieuwenhuijen, 2014: 172). It enables

organisations to allocate assets and liabilities in the face of risks. In the context of this study, “finance” means the process that petroleum companies in Nigeria go through to generate funds and utilise these funds for the day-to-day management of their businesses.

- Strategy

Strategy is the game plan for how companies identify activities that are needed to be carried out in the future to achieve organisational goals. Whatever an organisation does to attract customers to its products or services, away from their competitors, is known as “strategy manoeuvre” (Thompson, 2009: 2). Organisational strategy is any action taken by management to accomplish their vision that was as a result of the process of strategic thinking (White, 2004: 56). An organisational strategy in the context of this study entails certain tactics and actions that enable managers of petroleum companies to take up opportunities, limit risks and achieve set objectives.

- Derivatives

Derivatives are security apparatuses whose worth is contingent on another assets (Pike & Neale, 2006: 25). Derivatives are financial contracts entered into by two or more parties, utilised by organisations to hedge against risk exposure such as currency, commodity, and shares (Ehrhardt & Brigham, 2011:16). “Derivative” is a generic name given to instruments used for transferring risk from those who are exposed to risk but do not wish to be exposed, to those who are not exposed but would



rather be so (Gitman & Zutter, 2012: 641). In the context of this study, derivatives are financial contracts whose value depends on the value of another assets such as exchange rates and share prices. Derivatives are securities whose values depend on, or are derived from, the values of some other traded assets.

- Petroleum

“Petroleum” is the general name given to oil and gas, while “petroleum products” are specifically gasoline, naphtha, kerosene, fuel, lubricating oils, paraffin wax, and asphalt (NNPC, 2013). Collins Dictionary defines petroleum as “a dark-coloured thick flammable crude oil occurring in sedimentary rocks around the Persian Gulf, through distillation separates into petrol, paraffin, diesel oil, and lubricating oil.” In the context of this study, petroleum is the name given to the products of the oil and gas industry of Nigeria.

- Hedging

Hedging is an effort put in by an organisation to minimise the effect of financial risks of loss stemming from unfavourable movements in currency exchange rates, interest rates, and commodity prices that may include lending and borrowing in different currencies, options, futures, forwards, swaps and internal strategies (Gitman & Zutter, 2012: 742). Hedging is the purchase of derivatives for the reduction of financial risks of loss in a particular transaction (Ehrhardt & Brigham, 2011:158). Hedging is similar to insuring against financial risks. Hedging therefore, is moving the risk from one

organisation which is exposed to the risk but does not want it, to another which is willing to bear the risk. In the context of this study, “hedging” means the process that managers of oil companies undertake to mitigate negative effects and exploit positive effects of financial risks to be on the better side of a risk–return trade-off.

- Downside risk

Downside risk is the extent of an unexpected and undesirable loss occurring that may decrease the value of a business or investment within a period of time (Hallerbach & Menkveld, 2004: 567). In the context of this study, downside risk refers to the losses associated with the business of the companies in the Nigerian petroleum industry due to financial risk.

- **Upstream and downstream petroleum companies**

There are two main oil markets in Nigeria: an upstream and a downstream. The upstream oil industry, based in the fertile Niger River Delta, is the most important economic sector in Nigeria’s economy, producing over 90% of its total exports. The upstream companies are those whose operations involved crude oil exploration, production and transportation while downstream industry involves product refining, transport, storage, distribution and retail (Fernandes, Barbosa-Póvoa, & Relvas, 2010: 1). Upstream companies engage in oil exploration, prospecting, and mining of petroleum products (Giwa-Osagie, & Ehigiato, 2015: 219). 2011: 38

## **1.10 LAYOUT OF THE THESIS**

The thesis has been organised into seven chapters.

CHAPTER 1 is the introduction to the study. It explains the problem statement, and the study's aim, which is to move towards an integrated FRM for the Nigerian petroleum industry. The importance of the study is discussed, as well as the research questions, research objectives, and the research hypotheses methodology of the study, terminology, and layout of the thesis.

CHAPTER 2 is the overview of the petroleum industry of Nigeria. In particular, the chapter discusses the origins of the Nigerian petroleum industry, its governance, relevant legislations, its sectors and products, its importance, and its financing.

CHAPTER 3 reviews the theoretical perspectives on risk management in existing literature. The chapter examines the theoretical background for this study, detailing various risk factors in the Nigerian petroleum industry, financial risks and their impact on the industry, financial risk management challenges, the theoretical risk management frameworks and critical success factors.

CHAPTER 4 develops the proposed integrated financial risk management conceptual framework. It focus on combinations of various techniques and stages in FRM as advanced by contemporary literature, the conceptual framework in relation to the critical success factors, and the framework applicable to this study.

CHAPTER 5 describes the methodology of research and the data collection phase of the study. This includes the way in which data were collected and analysed to answer

the research questions. It also details the study paradigm, the population of the study, sampling method, and the data analysis method.

CHAPTER 6 deals with presentation, interpretation and analysis of the findings of the research. It details the demographic composition of the respondents, the empirical results from the study, differentiating between upstream and downstream responses, and qualitative results.

CHAPTER 7 summarises the main conclusions and recommendations of the research. It discusses the empirical findings and qualitative findings, limitations of the study, and possibilities for future research, as well as the contribution of the study to the understanding of FRM in the context of the Nigerian petroleum industry.

## **CHAPTER 2**

### **OVERVIEW OF THE NIGERIAN PETROLEUM INDUSTRY**

#### **2.1 INTRODUCTION**

This chapter provides an overview of the Nigerian petroleum industry its importance and challenges. In particular, the chapter discusses the origins of the Nigerian petroleum industry, its governance, relevant legislation, its sectors and products, its importance, and it's financing.

#### **2.2 THE NIGERIAN PETROLEUM INDUSTRY**

This section provides an historical overview of the Nigerian petroleum industry. This is necessary in order to place the present study into its appropriate context. The overview also provides some insights regarding the importance of the industry to Nigeria's economy and how the industry is governed.

##### **2.2.1 The origins of the industry**

Petroleum prospecting in Nigeria started as far back as 1908, when a German entity, the Nigerian Bitumen Corporation, started exploration activities in the Araromi, Western Nigeria until the outbreak of the First World War in 1914 (Nigerian National Petroleum Corporation [NNPC], 2010: 1). Exploratory activities resumed in 1937 when Shell Petroleum Development organisation of Nigeria (formerly Shell D'Arcy),

commenced oil prospecting activities in 1937. The organisation was granted the sole exploratory licence for the whole of Nigeria (Otiotio, 2012: 4).

The petroleum industry began commercial production in 1958, following Shell-BP's discovery of a profitable amount of oil at Oloibiri in 1956 (Lugard, 2013: 108). Nigeria was regarded as an oil producer in 1958 when its first oil field came on stream, producing 5100 barrels per day. Shell's monopoly of the Nigerian petroleum industry continued for many years until Nigeria became a member of the Organisation of Petroleum Exporting Countries (OPEC) in 1971 (NNPC, 2013). Other international oil companies who were extended the concessional licence to operate in the industry from 1960, were Mobil (now ExxonMobil), Elf Petroleum (now Total), Gulf Oil and Texaco (now ChevronTexaco), and Agip and Phillips. Nigeria allows these companies to operate under joint venture agreement with NNPC or production-sharing contracts in the upstream sector (Olayiwola, 2009: 2). Nigeria engaged in a number of joint ventures with International oil companies to develop the industry by the 1990s, but NNPC had challenges funding its commitments to the joint ventures that resulted in the use of production sharing contracts as alternate funding mechanisms.

These international oil companies who dominated the industry are still the major operators in the petroleum sector of Nigeria today, both upstream and downstream. There has been an emergence of smaller players at international and local level, as a result of sell-off of risky onshore concessions by these international oil companies and of new licence concessions granted by the government to encourage indigenous operators (Nwokeji, 2007: 8).

Shell's discovery of shallow water oil in 1965, south-west of Warri, signalled the beginning of offshore exploration (Shell, 2015: 1). The end of the Biafran war in 1970 together with the rise in the world oil price, increased revenue generation from the petroleum sector. Nigeria's membership of OPEC in 1971 and the formation of a national oil organisation, the NNPC in 1977, signalled the beginning of control of the oil industry in Nigeria. The production increased to two million barrels of crude oil a day by the late 60s and early 70s. The production level was low during the 1980s owing to general economic decline, but it picked up to a record level of two point five million barrels per day by 2004 (NNPC, 2010).

The Nigerian Oil and Gas Industry Content Development Act 2010 escalate indigenous involvement in the sector (KPMG, 2014:5). The Niger Delta area has a total of 606 oilfields; 355 are onshore 251 are offshore (NNPC, 2013). While 193 of these are currently functional, 23 are either shut or abandoned (NNPC, 2010).

The Nigerian Liquefied Natural Gas project which began in 1995, saw its first sale in 1999 at its Bonny Island plant. Nigeria has an estimated 159 trillion cubic feet of proven natural gas reserves, giving the country one of the top 10 natural gas endowments in the world (NNPC, 2013). According to the Nigerian Investment Promotion Commission, crude oil production in the first quarter of 2014 rose to an average of two point two six million barrels per day. Nigeria is ranked as the largest producer of oil in Africa and as the 13th largest oil producing country in the world.

## **2.2.2 Governance of the industry**

According to the Petroleum Industry Bill 2012: consultative forum, the following institutions or offices are responsible for the management of the petroleum sector.

### **2.2.2.1 Minister of Petroleum Resources**

The Minister of Petroleum Resources is the head of the Ministry of Petroleum, which falls under the executive arm of the government and oversees the petroleum sector value chain. Ministry of Petroleum is the ministry responsible for policies formulation, regulatory framework and ensuring execution through the under listed institutions (The Nigeria Petroleum Industry Bill, 2012: 13). The Petroleum Act, 1969, s 2(1) paras 1 to 4-13 provides for three types of licences for upstream operations. These are the oil exploration licence, oil prospecting licence, and oil mining lease. The Minister of Petroleum Resources grants a licence only to Nigerian companies or citizens (The Petroleum Act, 1969). The oil prospecting licence and oil mining lease give the owner the exclusive right to conduct petroleum operations in the granted area. The oil prospecting licences is allows for a primary term of five years for onshore and 10 years for offshore and inland basins, while the primary term of the oil mining lease is granted for 20 years, renewable for another 20 years.



#### 2.2.2.2 Nigeria National Petroleum Corporation

The NNPC is a wholly state-owned oil corporation that was established on 1 April 1977, with the main function of overseeing the regulation of the Nigerian petroleum industry, and a secondary mandate for upstream and downstream enlargement (Odularu, 2007: 6; NNPC, 2014: 1). Today, it has been transformed into a regulatory and business corporation to engage in exploration activities, refining activities, petrochemicals production, product transportation, and marketing. AS major player in both the upstream and downstream sectors of the Nigerian oil and gas industry NNPC owns four refineries in the country, which are located in Warri, Kaduna and two in Port Harcourt (Oladepo, 2014: 75). As a purely state-owned organisation, NNPC is entitled to enter into joint venture agreement with oil companies and to hold the right to all oil in Nigerian (Giwa-Osagie & Ehigiato, 2015: 232). NNPC formulates policies; it monitors and is a custodian of all unassigned acreage for the petroleum sector.

Regardless of the huge earnings generated from oil and gas, Nigeria has often not been able to fund its own share of the joint-venture contracts owing to mismanagement, corruption and transparency issues in the conduct of NNPC's affairs (McPherson & MacSearraigh, 2007: 197). KPMG (2014: 9) agrees that NNPC has been unable to meet its funding requirement for the joint-venture contracts.

The National Petroleum Investment Management Services is a subsidiary of NNPC in charge of investments for the Federal Government of Nigeria in the petroleum sector such as joint venture agreement with oil companies (KPMG, 2014: 10). It also

supervises the mechanism of funding joint venture operations through a “cash call” process. The National Petroleum Investment Management Services is the vehicle through which the NNPC formulates and enforces its local content strategy.

#### 2.2.2.3 Department of Petroleum Resources

Department of Petroleum Resources is the petroleum regulatory agency in Nigeria that has the statutory obligation to make certain that companies in the oil industry obey rules and regulations pertaining to the operation of the sector. Department of Petroleum Resources has the authority to monitor petroleum drilling wells, sites, platforms, export terminals, refineries, storage and pipelines, as well as petroleum products (Department of Petroleum Resources, 2015: 5).

#### 2.2.2.4 Nigerian Investment Promotion Commission

Nigerian Investment Promotion Commission is a government agency obligated to promote, monitor and coordinate all investment in Nigeria, including that of the petroleum sector that was established by the Nigerian Investment Promotion Commission Act no 16 of 1995: 3–4; Ekwume, 2005: 182).

#### 2.2.2.5 National Maritime Administration and Safety Agency

This agency was established by the National Maritime Administration and Safety Agency ACT of 2007 no. 17 to monitor and promote the development of indigenous

and commercial shipping in international and coastal shipping trade, and to regulate and promote maritime safety, security and marine labour among other duties.

#### 2.2.2.6 Nigerian Content Development and Monitoring Board

The Nigerian Oil and Gas Industry Content Development Act, 2010, charged the board to implement the provisions of the Act with regard to overseeing, synchronising, managing, monitoring and administering the development of Nigerian content in the petroleum industry (KPMG, 2014: 11). The Nigerian Content Development and Monitoring Board also supports local Nigerian companies in key developments such as increasing indigenous involvement and local capacity building, creating connections with other sectors, and growing sector contribution to the national gross domestic product.

#### 2.2.2.7 Niger Delta Development Commission

Niger Delta Development Commission was established in 2000 with the mission of facilitating the rapid, and even sustainable development of the Niger Delta into a region that is economically prosperous, socially stable, ecologically regenerative and politically peaceable. The Niger Delta Development Commission mandate includes the formulation of policies, guidelines and master plans, as well as tackling the ecological problem from pollution, and liaising with oil companies for prevention and to control the risk of oil spillage. As the majority of oil production in Nigeria comes from the Niger Delta and Benin basins (KPMG, 2014: 5).

#### 2.2.2.8 The Nigerian Customs Service Board

The Nigerian Customs Service Board is charged with the responsibility for formulating general policy guidelines for the Nigerian Customs Service and for the collection of customs and excise duties in the country. The Nigerian Customs Service Board carries out the administration of the Customs and Excise Management through the (Nigerian Customs Service Board Act of 1972 part 8 no. 10).

All of these governing bodies oversee the activities of petroleum companies in Nigeria, whose activities may have a positive or negative effect on FRM. The study now examines the major legislation which governs the industry.

### **2.2.3 Legislation governing the industry**

The major legislations and taxes applicable to petroleum sectors in Nigeria are discussed in this segment. This legislation has a direct effect on the financial performance of the oil companies under study.

#### 2.2.3.1 Petroleum Profits Tax Act

According to the Petroleum Profits Tax Act 1990 section 21(1 and 2), petroleum companies are subject to tax under the Petroleum Profits Tax Act based on their assessable profit for the year at 85% for joint venture agreements companies, or at 65.76% within first five years of operation. Petroleum companies are to pay 50% on

their assessable profit for the years during the contract period (PricewaterhouseCoopers [PwC], 2015: 144). Allowable tax depreciation on qualifying capital expenditure is at 20% flat rate, to 19% in the fifth year, and the balance is retained in the books. These taxes are higher than the usually government tax on organisation profit of 30%. Government very high taxes levied by government on the petroleum industry is to limit the number of operators and to exercise control against rapid running down of the assets for future generations of Nigerians (Nyekwere & Ambrose, 2017:142). Therefore, the high tax rate has a negative implication for investment in the industry. In addition, most international petroleum organisations have been found to engage in tax evasion, as Shell was made to pay N416 billion and Chevron was made to pay US\$10 billion for infringement of section 50(1) of the petroleum profit tax (Idubor, Asada & Adefi, 2015: 197).

#### 2.2.3.2 Deep Offshore and Inland Basin Production Sharing Contracts Act

Deep Offshore and Inland Basin Production Sharing Contracts Act 1999 enactment by Abdulsalami Alhaji Abubakar gives credibility to the incentives granted to petroleum companies operating in the deep offshore and inland basin areas under PSCs. Section 3(1) of the Act stipulates that the tax rate of 50% is payable.

Deep Offshore and Inland Basin Production Sharing Contracts Act also allows an investment tax credit claim of 50% of qualifying capital expenditure (for production sharing contracts signed before July 1998) or a petroleum investment allowance at 50% of qualifying capital expenditure for production sharing contracts signed after

July 1998. Section 5(1 and 2) specifies a royalty rate of 10% for companies operating in the inland basin and graduated royalty rates for companies in deep offshore operations according to the depth of water: 501 to 800 metres is 8%, 801 to 1000 metres is 4% and above 1000 metres is 0%.

#### 2.2.3.3 Tertiary Education Trust Fund Act

Section 2 of the Tertiary Education Trust Fund Act of 2011 obligates every organisation registered in Nigeria to pay 2% of its assessable profit as tertiary education tax. Nevertheless, petroleum companies are eligible for a tax deduction on the payable tertiary education tax.

#### 2.2.3.4 Companies Income Tax Act

The Companies Income Tax Act of 2007 stipulates that companies operating in all other segments of the petroleum sector that are not applicable to the petroleum profit tax, are assessed at 30 Kobo to the Naira or 30% of taxable profits contained in Section 40(1). Also, non-crude-oil-related income and profits earned by petroleum companies are liable to companies' income tax, separately. In practice, non-resident companies are taxed on a deemed profit basis at an effective tax rate of 6% of total revenue.

#### 2.2.3.5 The Petroleum Act (1969)

The Petroleum Act (1969) bestows all ownership and control of all petroleum resources on land, under the land, and under water, within the Federal Territory of Nigerian in the Federal Government of Nigeria. The Petroleum Act (1969) requires the holder of an oil prospecting license or an oil mining lease to pay royalties to the Federal Government of Nigeria as soon as drilling starts. The royalty rates currently applicable are as follows: onshore production is 20%; offshore up to 100 metres depth is 18.5%; offshore within 100 to 200 metres depth is 16.66%. In areas from 201 to 500 metres depth, the royalty rate is 12%; in areas from 501 to 800 metres depth it is 8%; in areas from 801 to 1000 metres depth, it is 4%; and above 1000 metres, the rate is 0% (PwC, 2015: 142).

#### 2.2.3.6 Value Added Tax Act (1993)

Section 2 of Value Added Tax Act (1993) involves a flat rate charge of 5% and is payable on supplies of taxable goods and services, except for those items which are explicitly exempted from value added tax (Idubor, Asada & Adefi, 2015: 193).

The Federal Inland Revenue Services issued a directive pursuant to the 2007 amendment, directing all companies operating in the petroleum industry to subtract value added tax at source from their vendors/suppliers' invoices and to remit it directly to the Federal Inland Revenue Services on or before 30 days following the month of collection as specified in section 15(1). Input value added tax acquired on overheads

and administration is to be taken as expenses in the profit and loss account for services companies, while value added tax incurred on fixed assets is to be capitalised. The fact that input value added tax is to be capitalised means that it may not be recovered in the year of the purchase of the assets; this is a discouragement to investment in the petroleum industry.

#### 2.2.3.7 Capital Gains Tax Act as amended 2004

The Capital Gains Tax Act 2004 as amended regulates the payment of capital gain tax in Nigeria. The rate of tax is currently 10% and is levied on capital gains accruing on the disposal of chargeable assets, irrespective of whether the asset is situated in Nigeria or not. Capital gains accruing outside Nigeria to a non-resident organisation or to an individual are subject to capital gain tax only on the amount received or brought into Nigeria. Idubor, Asada and Adefi, (2015: 197) are of the view that high taxes discourage investment in virgin oil exploration, and reduce the funds available for research and staff development.

#### 2.2.3.8 Withholding Tax

Investment income derived within Nigeria by a person resident outside the country, is characteristically only liable to withholding tax. The person making the payment is required to deduct tax at the applicable rate and remit the tax up to 21 days after deduction, or when the invoice is credited, whichever is earlier. Withholding tax rate is



either 5% or 10%, depending on the nature of the transaction and the beneficiary of the payment.

This concludes discussion of the laws that have an effect on operations and FRM in the petroleum sector. The next section looks at the industry's divisions.

#### **2.2.4 Divisions of the industry**

The industry is made of two divisions or what are called “streams”, which are upstream, and downstream. The upstream division is dominated by those whose activities concern the exploration and development of oil fields and transportation, while the downstream is concerned with refining and sales of products (Enyinda, Briggs, Obuah and Mbah, 2011: 38).

##### **2.2.4.1 Upstream activities**

Companies that wish to operate in the upstream sector, need to obtain two types of licences namely: the oil prospecting licence and the oil mining licence with validity periods stretching from 5 to 20 years respectively according to the NNPC. The major companies operating in this sector of the industry, operate either in joint venture partnerships with NNPC, or in production sharing agreements (NNPC, 2013). The others operate as independent or services companies. The agreement details the percentage interest of each partner in the joint venture, relationships between partners, crude oil lifting, budgetary approvals, the sale of crude in proportion to equity,

and funding by the partners (NNPC, 2013). The memorandum of understanding directs the method of distribution of income, apportionment of operating expenses, payments of taxes and royalties.

The production sharing agreement is an understanding between NNPC and international oil companies on the sharing of the production output of petroleum operations in agreed proportions between the oil organisation, as a contractor to the government, and the NNPC (Oduntan, 2015: 39). Under the production sharing agreements, contractors are allowed to engage in oil and gas exploration activities while bearing the cost and risk associated with exploration activities (Nyekwere & Ambrose, 2017:145). They can only recoup the cost from the allocation of oil and gas after a commercial find. After making allowance for royalties, the production is shared between the organisation and NNPC according to the agreed proportion. Since the petroleum companies are allowed to recover the cost incurred in full, the oil and gas infrastructure remains the property of the Federal Government of Nigeria throughout the duration of the contract. Otio (2012: 6) explains that NNPC is involved with six international oil companies and one local organisation in joint venture contracts.

NNPC has 17 production sharing contracts with Addex, Snepco, Stat Oil, Esso, Oranto, Ocean Energy, Philips, Conoco, ChevronTexaco, Elf, NAE, and Petro Brass, as well as one service contract with Agip (Otio, 2012: 6).

#### 2.2.4.2 Downstream activities

The downstream petroleum division comprises refinery activities where the crude oil is converted into end products, as well as activities of transportation, distribution and marketing to the ultimate consumer (Enyinda et al., 2011: 38). The downstream division has four refineries with a total capacity of 445,000 barrels per day, more than five major oil petroleum companies, and over 350 independent petroleum product marketers (Oladebo, 2014: 71). All four refineries are owned and managed by NNPC as the sector faces price control and subsidy systems that discourage private investment. As a result of inefficiency, none of the refineries is operating at full capacity. The operation is about 30% capacity, hence marketers have to import refined products to supplement domestic demand (KPMG, 2014: 10). In 2013 the annual statistical report of NNPC (2013: 67) shows that the refineries operated at 25% capacity. The Petroleum Product Pricing Regulatory Agency is responsible for the determination of wholesale and retail prices of petroleum products in Nigeria (Oladebo, 2014: 71).

The industry today is made up of the major marketers such as NNPC, Mobil Oil Nigeria PLC, Total Nigeria PLC, Oando PLC, MRS Oil Nigeria PLC, Forte Oil PLC, and Conoil PLC, most of them being the downstream arms of the international oil companies (Oladebo, 2014: 74).

### **2.2.5 Products of the industry**

The major products of the downstream sector are liquefied petroleum gas, premium motor spirit, household kerosene, automotive gas oil, low poor fuel oil, and high poor fuel oil. According to the NNPC annual statistical report of 2013, the petroleum products are crude oil and gas for the upstream division, while the downstream division products are liquefied petroleum gas, premium motor spirit, household kerosene, automotive gas oil, fuel oil, long residual sulphur, asphalt, vacuum gas oil and kerosolvent (NNPC, 2013).

As a result of accumulative negligence and poor maintenance culture, most petroleum products are now being imported for local consumption (Oladepo, 2014: 80). The major oil depots of NNPC in Nigeria are situated in Aba, Benin, Enugu, Ibadan, Gombe, Ilorin, Jos, Kaduna, Kano, Lagos, Maiduguri, Markurdi, Mosimi (via Shagamu), Ore, Port Harcourt and Warri. The estimated quantity of petroleum products distributed by the major and independent marketing companies in 2013 was about 2,721.6 million litres.

### **2.2.6 Importance of the petroleum industry to Nigeria and the world**

The petroleum industry plays a pivotal role in the economy of Nigeria for customers, contractors, employees and shareholders. Petroleum production and exportation has become the backbone of the Nigerian economy (Oladepo, 2014: 80). The revenue derived by the Nigerian government from the exportation of petroleum products

account for 96% of total exports according to the (International Monetary Fund [IMF] 2015). This indicates that Nigeria operates an economy that is not diversified and depends solely on the petroleum sector for existence. Therefore, any issue that will destabilise this sector will generate a huge impact on the macro-economic stability of the whole country.

In addition to export revenue, Nigerians depend heavily on the petroleum industry for their energy needs, for transportation, cooking, power and for micro-industries that are helping in unemployment reduction (Odularu, 2007: 14). The sector generates foreign direct investment inflows into Nigeria, boosts labour productivity, income and taxes (Akinlo, 2012: 166). The output from the petroleum sector is utilised as input for other industries such as the plastic, packaging and cosmetic industries which rely heavily on the output of the oil sector. The exchange rate of the Naira compared to other major currencies hinges on the price of oil and gas and all infrastructural development (CBN, 2013). Jibrin, Blessing and Ifurueze's (2012: 60) analysis of the impact of petroleum profit tax on the growth of the Nigerian economy found a significant positive relationship between oil-related taxes and the gross domestic product.

The petroleum sector boosts local demand for oil- and gas-related inputs of goods and services (Akinlo, 2012: 166). It also enhances petroleum-related skills development and employability of youth. As a result of revenue from the petroleum sectors, Nigeria has been able to reduce its external debts to US\$6.92billion (CBN, 2013: 81).

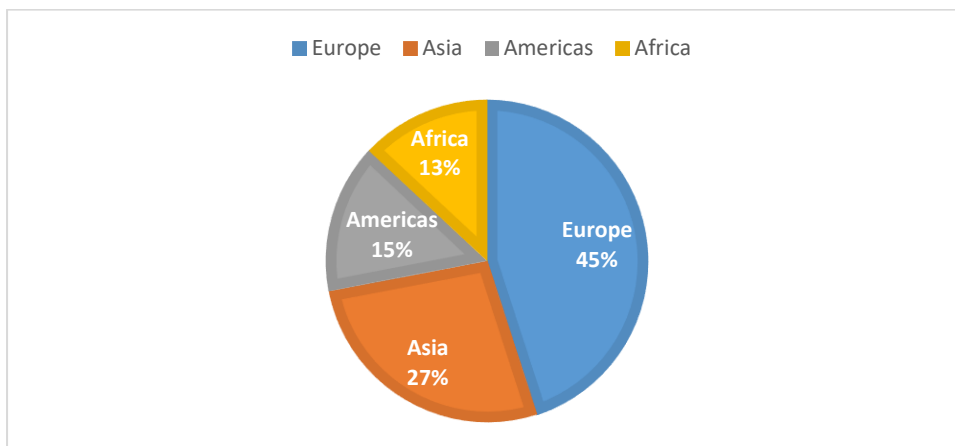
Notwithstanding the fact that Nigeria is one of leading oil-producing countries of the world United States (Energy Information Agency (EIA) (2013), Nigeria is categorised as one of the poorest countries in the world according to Arong and Ikechukwu, (2013: 123). One of the major issues is that Nigeria exports raw products, oil and gas, and imports several petroleum products such as fuel, diesel and kerosene at a higher cost than the exported product. Therefore, any gain derived from the export becomes a loss in the process of importation, which is destroying the Nigerian economy (Arong & Ikechukwu, 2013: 123).

An important issue is that of environment degradation by oil companies due to lack of enforcement of existing laws and corruption in the system on the part of the government, which had destroyed the livelihood of millions of people in the Niger Delta region where most of the oil fields are concentrated (Odularu, 2007: 15). Poorly maintained ageing pipelines in addition to pipeline sabotage from oil theft, have been causing major oil spills. The oil spills have resulted in the pollution of land, air, and water, severely affecting surrounding villages by decreasing fish stocks and fouling water supplies and arable land (EIA, 2013). Companies' utilisation of derelict infrastructure, gas flaring and use of unconventional management strategies are said to be responsible for environmental degradation (Ugbomeh & Atubi, 2010:106). Oil theft and the communities themselves are somehow associated with the rate of pollution currently witnessed in the Niger Delta by vandalising infrastructure and oil installation (Shell, 2011: 1). Of the 14 incidents reported by Shell in the month of January that year, 11 were credited to sabotage.

Arong and Ikechukwu (2013: 123) suggest that an effective risk management system that is not based on the use of derivatives alone, needs to be put in place for the survival of this all-important industry. The CBN was perturbed by the discovery of shale oil in the United States of America (US) and forecast a decrease or subduing of foreign exchange inflow in 2013 (in other words, an unstable foreign exchange market). The Naira deteriorated badly in early part of 2015 as the result of the low price of petroleum products.

Nigerian oil and gas are exported to Europe, Asia America, and Africa, but revenue for the first half of 2013 declined. This was as a result of the disruptions in crude production by 10.9% and 19.8% to US\$19.75 billion from the levels in the first and second halves of 2012, respectively (CBN, 2013: 27).

**FIGURE 2.1 NIGERIA'S CRUDE OIL AND CONDENSATE EXPORTS BY DESTINATION, 2014**



According to figure 2.1, Europe was the largest regional importer of Nigerian crude oil in 2014, accounting for 45% of exports, followed by Asia at 27%, the Americas at 15%,

and Africa accounting for just 13%. A CBN report on the first half of 2013 showed that the petroleum industry was the greatest foreign importer in the economy, accounting for 30.9% utilisation of foreign exchange. Nigeria exported roughly 800 billion cubic feet of liquefied natural gas in 2013, ranking it among the world's top five liquefied natural gas exporters, Japan accounting for 23% of Nigerian gas importation, followed by South Korea and Spain while Europe has decreased its imports and the US did not import from Nigeria in 2013 according to EIA, in 2013.

### **2.2.7 Financing the industry**

Financing refers to the funding needed by the petroleum industry in order to undertake projects and deliver returns. The financing need of the petroleum industry of Nigeria is estimated to be between US\$25 billion to US\$30 billion annually (Oni, 2014: 5). The Nigerian petroleum sector finances its operations through various sources, such as equity, loans from banks, retained income, commercial papers to private investors, bonds from others sources, foreign loans and joint venture operators, world banks and free cash from trade creditors (Oni, 2014: 6). The international organisation mostly depends on loans from foreign banks and bonds as this system helps them to balance foreign exchange risk.

The organisation, Ernst Young (2013: 1a) is of the view that oil companies finance projects through the following sources: initial public offers, equity, reserves, bonds, project joint venture agreements, production sharing agreements, development banks, cash flow from operations, bank loans and the proceeds from selling off assets. In a



nutshell, companies in the industry finance exploration and production through equity and debt instruments (Vanguard online, 2014).

#### 2.2.7.1 Equity financing

Financing through the stock exchange always involves several stringent measures. The Securities and Exchange Commission has to scrutinise an entity's operation and financial health; therefore companies only do so when their share value is high. The oil price regime of March 2015, had moved investors not to be willing to stake too much fund into the petroleum industry. This source of financing is only available to companies listed on the stock exchange. The listing requirements of the Nigerian Stock Exchange can be overwhelming for new companies. According to the Nigerian Stock Exchange, organisations who wish to list must have audited financial records for the past three years with a profit of at least N300 million and the last audited financial statement must be not less than nine months old. Hence, many oil companies are not listed on the exchange. The major players in the upstream industry are listed on various other securities exchanges such as the London Stock Exchange and the New York Stock Exchange, in order to generate funding for projects.

Projects could also be financed with internally generated funds (Oni, 2014: 6). This source requires that companies retain certain percentages of their income over time. Again, this is only available to companies who are taking up opportunities, and managing risks to generate enough profit to meet or exceed the expectations of the shareholders.

### 2.2.7.2 Debt financing

Debt financing accounts for a larger fraction of oil prospecting and development projects financing in the industry (bank loan, bond, and debenture), with equity contributing only a small percentage, as projects that are relatively large usually take longer to complete (Annamalai & Jain, 2013: 252). Debt funding could be in form of a bond, commercial paper or debenture issued through the capital market or through a bank loan in the money market. The bond market usually is attractive to investors as it offers less risky investment and steady earnings (Oteh, 2010: 4). Although a bond is a popular source of funding for international oil companies in the industry, it is rarely utilised by indigenous Nigerian petroleum companies according to the Nigerian Stock Exchange list.

### 2.2.7.3 Commercial bank financing

The Director of Petroleum Resources was of the view that the banking sector was not capable of exclusively financing exploration in the petroleum industry, as bank capitalisation did not permit them to do so (Vanguard online, 2015). Yet, banks' total loan book exposure to the oil sector ranged from 17% to 40% of the total loan (Financial Times, 2015).

Banks advanced over US\$2.5 billion (about N437.5 billion), to indigenous companies for the acquisition of the divested assets of Shell, and other oil companies in Nigeria (Ejoh & Amodu, 2014: 1). Federal government's local content initiative, targeted at the

oil sector as well as other critical sectors of the economy, was prompting banks to finance independent petroleum marketing members and others buying up oil blocks that are being diversified by international oil companies as a result of operational issues (Giwa-Osagie & Ehigiato, 2015: 224). As at June 2014, loans to finance these acquisitions accounted for over 24% of the loan book of the banking industry (CBN, 2014). The reliance of oil companies on bank loans for project financing is unsustainable as these companies required equity funding to see the industry prosper (Oni, 2014: 8).

#### 2.2.7.4 Challenges of financing in the industry

Financiers normally watched for companies in the Nigerian petroleum sector that are led by highly experienced management teams, with a good reputation and good financial track records to invest their fund. Therefore, the independents operators are faced with more challenges in securing finance at reasonable rates than are their larger counterparts (Ernst Young, 2013: 2a). Environmental concerns had been prominent issues in financing oil and gas projects as investors always looked for companies that their operation in exploratory and exploitation are up to standard regarding oil spills and clean-up operations (Razavi, 1996: 2).

Ernst Young (2013: 3a) indicate that:

- Equity capital market conditions for most small exploration companies remain difficult, following the financial crisis.

- Companies without cash flow from operations, lacking in scale or with risk concentrated in a single project or country are likely to face a more challenging funding outlook.
- By contrast, companies that have attained exploration and commercial accomplishment will face fewer challenges in raising capital.

The issues raised by Ernst Young are compounded by the uncertainty surrounding the demand for oil and gas, as consuming countries continue to send mixed signals (OPEC, 2014). There is a structural funding deficiency in the petroleum companies arising from the fact that they are highly dependent on the ailing banking industry rather than on equity funding provided by institutional investors; most of the local companies cannot meet the Securities and Exchange Commission requirements to raise equity funding (Ecobank, 2015: 6). Banks are concerned about continued oversupply to the global oil market and the weak global economic picture, which could constrain oil demand and also the repayment of loans (Ecobank, 2015: 1).

#### 2.2.7.5 Measures to overcome financing challenges in the industry

The alternative to financing challenges facing the industry lies in the generation of internal funding. This could be made possible by having an effective financial control and management of downside financial risks, and by exploiting opportunities presented by upside financial risks onto the better side of the risk/return trade-off. Another long-term strategy is to be innovative and diversifying into other industries whose products are not priced internationally.

## **2.3 SUMMARY OF CHAPTER**

In this chapter, the history of the Nigerian petroleum industry and development of the industry was discussed. The various governmental departments and agencies responsible for the governance of the industry were detailed. The various relevant legislations applicable to the industry were also outlined. The sectors (upstream and downstream) and products of the Nigerian petroleum industry were introduced, and the importance of this petroleum industry to the world, Nigerian economy, people and various financing options was elaborated on. The next chapter concerns the theoretical perspectives of financial risk management.

## **CHAPTER 3**

### **THEORETICAL PERSPECTIVE ON RISK MANAGEMENT**

#### **3.1 INTRODUCTION**

This section of the study reviews the literature that is pertinent to the study, bearing its purpose in mind, namely the development of an integrated FRM framework for the Nigerian petroleum industry. The problem identified is the lack of an empirical integrated FRM reference framework which managers could rely on in managing financial risks in this industry. The study argues that the sustainability of an FRM system should be accredited to the formulation of an integrated framework that takes into consideration the critical success factors since FRM depends on the people, process and technology.

This chapter outlines the financial risk factors in the petroleum industry. It explores the various financial risks and their impact on the oil and gas industries and details the FRM challenges which these industries face. The chapter then examines the theoretical perspective of various FRM frameworks.

#### **3.2 FINANCIAL RISK FACTORS IN THE NIGERIAN PETROLEUM INDUSTRY**

This section reviews the literature relating to financial risk factors that are affecting the petroleum industry of Nigeria, starting with the definition of risk.

### **3.2.1 Risk defined**

Risk in the context of this study is the possibility of financial consequence on the objectives of petroleum companies operating in Nigeria which may be positive or negative (Crouhy et al., 2006: 25). The higher the possibility of the effect on the objectives of Nigerian oil companies, the higher the risk. Risk does not occur in a vacuum but as a result of various variables, which in finance are referred to as risk factors, and the interactions of these risk factors (Fernandes et al., 2010: 2). The risk factors can emanate from the internal petroleum companies' actions or inactions of its workers and management, processes (ways in which things are done or culture), and its systems – which refers to its structures and chain of command, or to its roles, responsibilities and accountability, information systems, communication systems, reward and re-enforcement systems, as well as training and development systems (KPMG, 2008:6–9; Yantinga & Liyunb, 2011: 2332–2333). These risk factors could arise from transactions of the Nigerian petroleum companies with other parties, such as contractors, joint venture partners, customers, creditors, countries, states, and host communities (Kaplan & Mikes, 2012: 51).

Financial risk in the context of this study is the probability of loss or gain resulting from events such as market prices changes for petroleum products, changes in the interest paid for debt capital, changes in the exchange rates of the Naira in relation to other major currencies, changes in the share prices of the petroleum sector companies, and strategic risks with financial implications (Bigliani, 2013: 1). Horcher (2005: 3) outlines these sources of financial risks: market conditions, actions and transactions with other

organisations, and internal action or failure of companies. These financial risks arise through various transactional activities of a financial nature in the petroleum sectors, which could be in the form of exploration, production, transportation, refining, and distribution of products in new projects, mergers, joint ventures, or production-sharing contracts (Enyinda et al., 2011: 38). Other factors that can generate financial risks in the Nigerian petroleum industry are regulatory frameworks of the host country and those of other countries, economic conditions of the nations of the world, speculative activities, decisions taken by OPEC, the United Nations, and the World Bank, as the operations of the petroleum industry in Nigeria depend on the price of oil and gas in the international market (Shell, 2013: 7).

### **3.2.2 Types of financial risks in the petroleum industry**

Oracle (2011: 1) suggests that the petroleum sector is comprised of companies and individuals who take high risks with the hope of a high return. The industry is faced with risks that are strategic, operational and tactical (PRMA, 2010: 4). Strategic risks which involve exploration, development and extraction of oil and gas several miles below the surface of the Atlantic Ocean are accepted by the oil companies operating in Nigeria, because of the high volume of oil and gas they hope to extract (Kaplan & Mikes, 2012: 50). Operation risk can originate from corporate level activities such as those that relate to infrastructural destruction, business disruption, pollution, and injuries to people – all of which are inherent in normal oil and gas activities (Bigliani, 2013: 1) The industry in Nigeria is also susceptible to various economic-related or tactical exposures like market risks, transactional risks, funding risks, economic policy

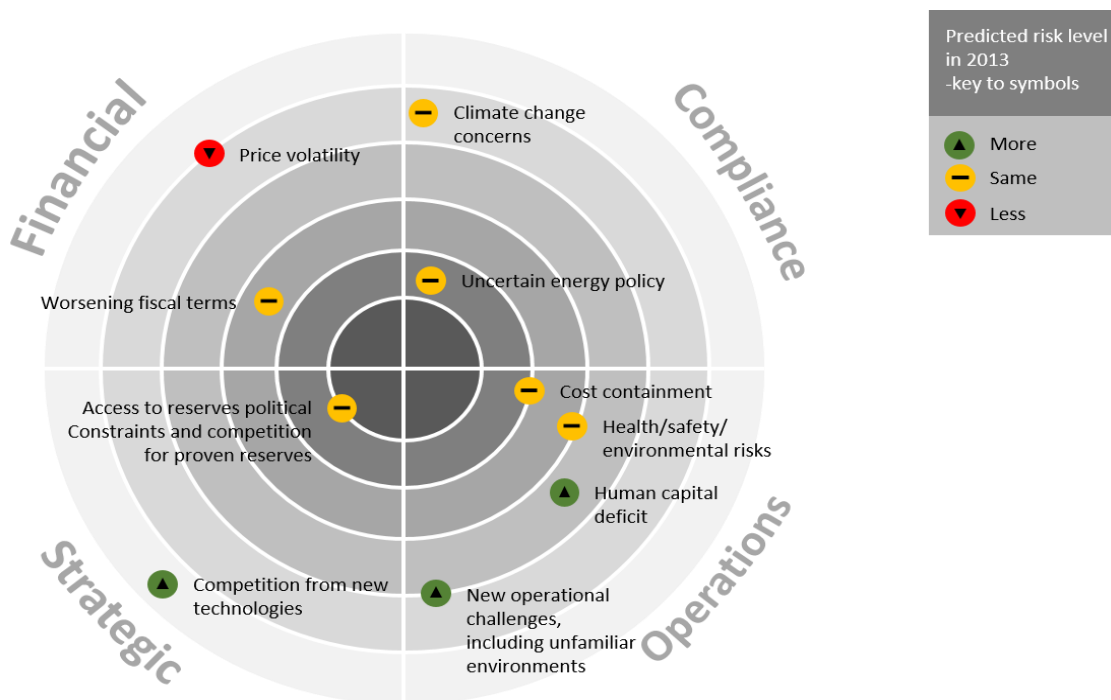


risks, and translation risks (which is when companies operating international transfers their overseas earnings to local currency). (Yantina & Liyunb, 2011: 2332).

Bigliani (2013: 1) outlines the following financial risks facing the petroleum industry of Nigeria: unpredictable commodity prices, which do not depend on just basic supply and demand but are connected to global political and socioeconomic factors; health, safety, and environmental issues either from past or recent major accidents; interest rate instability; exchange rate variability and bad industry image. Enyinda et al. (2011: 38) state that the petroleum industry is prone to various risks factors that can impact on companies' financial performance and competitiveness. After regulatory risks, the highest risks in the industry are financial risks and currency/interest rate instability (Kearney, 2005, as cited by Enyinda et al., 2011: 38). The Eni Annual Report of 2013 states that some of its projects are expansion into reserves in high-risk areas, mainly offshore, in secluded and unfriendly environments. During the period of "the boom" in 2007 the case for good strategic FRM did not feature much on the agendas of these companies. But today's environment of low margins, according to Oracle (2011: 1), calls for effective strategic FRM.

The top 10 risks facing the oil industry in Nigeria, according to Ernst Young (2011: 9) are as shown in Figure 3.1.

**FIGURE 3.1: TOP 10 RISKS IN THE INDUSTRY IN 2011**



Source: Adapted from Ernst Young (2011)

Energy Digital (2012: 1) outlines these top 10 risks facing the industry as: regulatory change and increased cost of compliance, volatile oil and gas prices, inability to expand reserves or find replacement reserves, operational hazards including blowouts, spills and personal injury, natural disasters and extreme weather conditions, incorrect reserve estimates, inadequate liquidity or access to capital, indebtedness, environmental or health restrictions and regulations, general national or global economic concerns, and general industry competition.

Some of the most important risks with serious financial implications are now explained in detail below.

### 3.2.2.1 Geological risks

Companies in the sector are faced with geological risks such as dry holes and failure to find cost-effective amounts of hydrocarbons, which have financial implications (Eni, 2013: 93). Risk factors such as unforeseen drilling settings, the thickness in formations, device failures, blowouts, shortage of implements, and delays in the delivery of equipment are day-to-day happenings in the industry (Eni, 2013: 93). Oil and natural gas exploration can involve unbeneficial efforts, not only from dry wells but probably from wells that are fruitful but do not produce enough net present value after drilling according to the oil organisation (Petro Kamchatka, 2009: 1).

### 3.2.2.2 Operational risks

Operational risks are caused by mistakes or omissions on the part of those who manage the operational process of production of goods and services, failure of technology, or the process itself (Bodla & Verma, 2008: 633). Basel Committee on Banking Supervision [Basel II], 2004: 139) defines operational risk as “the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events”. Bigliani (2013: 2) is of the view that the management of oil and gas projects is becoming more intricate as globalisation, heightened competition, high-tech development and increased pressure on cash flow are becoming commonplace in the industry. These Nigerian petroleum companies operate in an environment where completion of projects depends on their negotiation skills with their joint venture partner companies such as NNPC, suppliers, federal governments and customers;

shorter contracts are usually negotiated under unfavourable conditions (Eni, 2013: 95). Other problems in the industry in Nigeria are the shortage of skilled personnel and shortage of equipment that has to be sourced from outside the country, which can lead to cost escalation (Bigliani, 2013: 3). Therefore, in order to succeed in this industry, these risks have to be constantly evaluated and managed to determine the risk/return trade-off. Another risk is the price of oil and gas which is one of the determining factors for the development of an oil rig.

### 3.2.2.3 Oil and gas price fluctuation

The single largest variable that affects these companies' ability to perform their operational and financial functions is the price of crude oil and gas (Eni, 2013: 174). The price of oil and gas determines whether an oil rig development is undertaken or not, because these companies have to appraise the viability of the project or its net present value. Eni (2013: 174) highlights that financial conditions in the industry depend on the ability to increase oil and gas reserves and increase return margins, which is fully dependent on whether the oil price is high enough. An audit and assurance organisation, BDO's (2016: 2) findings indicate that unpredictable oil and gas prices once again top the list of risks facing petroleum companies in 2016, reducing cash flow, profitability, and increasing project shelving and workforce cutting.

The projects listed in Table 3.1 which are earmarked for 2016 to 2020 in the petroleum industry depend on the price of oil and gas being higher than the cost of production

(EIA, 2015: 10). However, if the oil price remains at the level of March 2015, none of these projects will be executed.

**TABLE 3.1 PROJECTS FOR 2016 TO 2020 AND BEYOND**

<b>Project name</b>	<b>Operator</b>	<b>Type</b>	<b>Plateau liquids production (000 in thousand bbl/d)</b>	<b>Final investment decision?</b>	<b>Est. start</b>
Dibi ongTerm	Chevron	onshore oil	70	yes	2016
Sonam Field	Chevron	natural gas	30	yes	2016
Gbaran/ubie	Shell	natural gas	20	yes	2017
Erha North	ExxonMobil	Deep-water	60	yes	2018+
Egina	Total	Deep-water	200	yes	2019+
Bonga/Aparo	Shell	Deep-water	225	no	2020+
Zabazaba/Etan	Eni	Deep-water	120	no	2020+
Bosi	ExxonMobil	Deep-water	140	no	2020+
Nsiko	Chevron	Deep-water oil	100	no	2020+

Source: US Energy Information Administration based on reports from Chevron Corporation, ExxonMobil, Royal Dutch Shell, Total, and Oil & Gas Journal

#### 3.2.2.4 Demand and supply risk

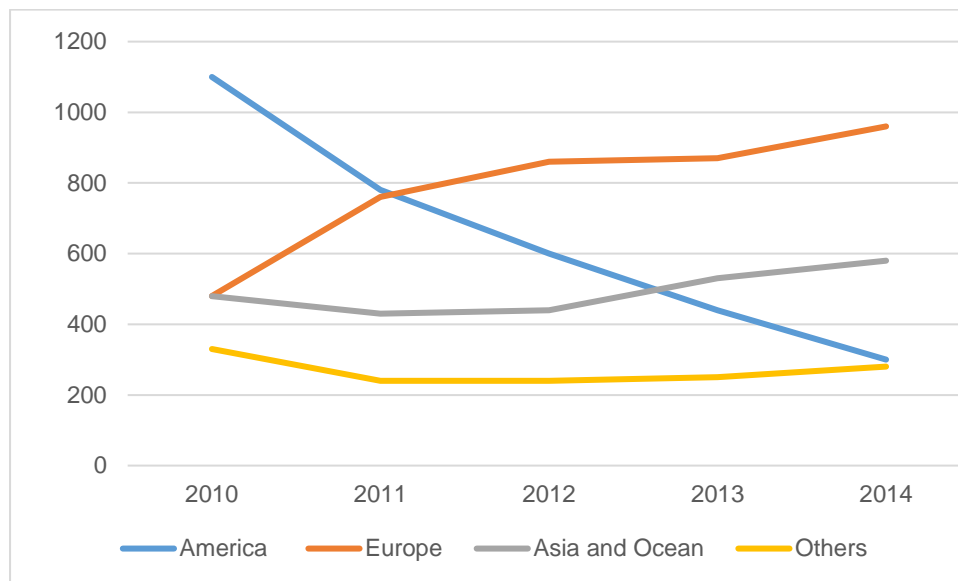
Prices depend on international supply, demand and other factors that are beyond the control of any of the companies that operate in the oil and gas industry. The following external factors contribute to some of the financial risks faced by the industry (Shell, 2013: 7):

- decisions by OPEC having a significant effect on the world's supply of oil and price levels;
- United Nations consensual sanctions or interruptions due to local instability as is currently the case in the Niger Delta;
- global demand and supply of oil and gas, for example, slow-moving economic activity in Europe;
- more proficient use of fuels and energy by the countries of export;
- the rise of and availability of alternative sources of energy;
- governmental regulations, such as limitation of greenhouse gas emissions, impacting on the price of hydrocarbons;
- applying new technology or alternative energy; and
- seasonal weather affecting the supply and demand of the sector products.

The recent OPEC agreement not to cut the quota for the production of oil and gas has sent oil prices on a downward trend. Similarly, the increased production of shale oil and gas in the US has not helped the oil price, and the oversupply by non-OPEC countries and a slow economy in the Eurozone has kept oil prices down, according to

the CBN (2014: 55 & 64). Figure 3.2 shows the crude and condensation exports by Nigeria per region (EIA, 2015:10). Figure 3.2 showed that the European region imports more Nigerian oil than any other world region. The Asian region is the second largest importer while the oil imports of the America region have declined to their lowest in 2014.

**FIGURE 3.2 NIGERIAN CRUDE AND CONDENSATION EXPORTS BY REGION**



Source: US Energy Information Administration 2015

### 3.2.2.5 Cost risks

Offshore oil and gas expansion are gradually tipping towards large-scale investments because of the rapid exploratory success in the industry (Oracle, 2011: 2) Tasks such as arranging logistics, planning and scheduling, dealing with customers or contractors, joint venture partners, and risk analysis, are fraught with many risks that are financial in nature, and which will decide whether or not the investment is worthwhile (Enyinda et al., 2011: 38). Moreover, owing to the long-term nature of oil projects, changes in

exchange rates could create unanticipated changes in the cost structure of these projects (Fernandes et al., 2010: 1). Therefore, reducing costs is one of major areas of emphasis for petroleum sector companies. To generate revenue for the growth and continuity of these organisations, financial risks in particular have to be minimised (Oracle, 2011: 1).

### 3.2.2.6 Bottom line risks

The risks associated with the obligation to meet investors' expected rate of return are very evident in the oil industry of Nigeria. Companies executing projects with partners and in co-ventures have a reduced ability to manage risks and costs (Eni, 2013: 93). In Nigeria, most of the oil and gas exploration and development are done in partnership with NNPC. Price fluctuation as a result of oversupply and low world demand for oil and gas is putting serious pressure on profitability (Rigzone, 2014: 1). Advancement in technologies for exploration and production, plus those of alternative power generation and electrification, are also impacting on the bottom line (Reis, 2016: 17). The militant activities in the Niger Delta of Nigeria have negative consequences for profitability. This is compounded by the problem of oil theft that has resulted in a loss of US\$10.9 billion in potential oil revenues for the period 2009–2011 for the petroleum sector (Reuters, 2013). Tax in the sector is higher than the general tax of 30% of profits for companies (Petroleum Profits Tax Act 1990: 19).



### 3.2.2.7 Credit risks

Credit risk arises as a result of credit sales, purchases, lending, investing, borrowing, or other contractual activities whose payments or receipts are in the future (Horcher, 2005: 103). Payables and receivables generate credit risk for the petroleum sectors as contracts for sales and purchases are made on a future settlement basis. Every transaction that is effected, whether financial or not, has at least two parties that are involved, and each party runs the risk of default (Merna & Al-Thani, 2008: 107). Credit risk is the risk that a party who needs to make payment on a sale, loan or derivative arrangement, is unable to make the necessary payment (Chance & Brooks, 2008:5 41). The Bank of England has anticipated a situation where oil companies will not be able to perform their contractual obligations to bondholders if the present low oil price persists (Guardian online, 2014). Ericsson and Renault (2006: 2219) find a significant positive correlation between cash flow problems and credit risk.

### 3.2.2.8 Interest rate variability

Companies operating in the oil industry in Nigeria are exposed to diverse sources of funding, within and outside Nigeria, to meet expected funding costs. They are therefore exposed to interest rate changeability. Interest rate risk is the sensitivity of operational income, cash flows or valuation of an organisation caused by interest rate movements (Buckley, 2004: 331). Interest rate exposure can occur as a result of macro-economic exposure and interest receivable/payable. The interest rate is

important to these corporations because it helps to determine the cost of capital that is used to value all business undertakings (Horcher, 2005: 8).

There are three types of risks associated with changes in interest rates. They are credit risk, re-pricing or rollover risk, and counterparty risk, as identified by Crum, Brigham and Houston (2005: 468). Credit risk is the fact that creditworthiness of the organisation may decline; therefore borrowing will become more expensive, even when the interest rate remains unchanged (Crum et al., 2005: 468). Repricing or rollover risk occurs when the terms of a debt or investment agreement have expired and the interest rate has changed either favourably or unfavourably (Pike & Neale, 2006: 335). Counterparty risk is the risk that the other party to a contractual arrangement may not be in a position to fulfil its part of the agreement (Crouhy et al., 2006: 29). The Central Bank of Nigeria may increase or decrease interest according to economic conditions such as inflationary pressure and demand for debt (Moosa, 2004: 102).

### 3.2.2.9 Currency fluctuation

The Nigerian petroleum sector's cash inflows are dominated by the US dollar while most payments such as salaries, office running costs, contract payments and taxes, are dominated by the Naira, creating exchange fluctuation problems for the industry operators. Foreign exchange risks mostly affect businesses like the petroleum sector companies of Nigeria which trade internationally, since it affects the cash flows, sales and competitive position in the product market (Bartram, Brown & Minton, 2010: 148).

The oil companies that operate in Nigeria participate in various local, regional and international markets, facing different conditionalities in respect of requirements for the sale of products and the purchase of capital, hiring of the labour force, and paying off contractors (Eni, 2013), such as the requirement of repatriation of proceeds of export of petroleum products within 90 days of sale. Foreign exchange fluctuation is found to be significantly linked to cash flow problems and the value of oil organisation stock risk (Bartram, 2007: 981).

Foreign exchange exposure is the risk that changes in spot rates over time would have on the objectives of an organisation, either positively or negatively (Correia, Flynn, Uliana, & Wormald, 2007: 19–17). Foreign exchange risk occurs when receivables and payables of foreign denominated currencies of an organisation are not perfectly matched which is the case in the Nigerian oil industry where earnings are in US dollars and expenses are in Naira (Andersen & Schroder, 2010: 38; Andersen, 2010: 101). The three types of foreign exchange exposures are transaction exposure, economic exposure, and translation exposure (Buckley, 2004: 135).

Transaction exposure occurs when an organisation has receivables or payables denominated in currencies other than the organisation's home currency (Pike & Neale 2006:598). Fernandes et al. (2010: 1) observe that oil and gas equipment items such as platforms, rigs, tankers and refineries required by this industry in Nigeria are expensive and may face currency variability as the capital equipment are imported. Transaction exposure may occur as a result of the purchase or sale of goods whose payment has to be effected at some time in the future, such as future oil and gas sales

(Correia et al., 2007: 19–19). Andersen and Schroder (2010: 39) argue that transaction exposure occurs as a result of import and export, foreign direct investment, and borrowing and lending in foreign currencies, which is commonplace in the petroleum industry. Horcher (2005: 31) contends that these types of exposure affect any organisation outside the US whose product is priced in US dollars, even when its whole operation is in the home country, such as companies in the Nigerian petroleum industry. Therefore the strategic location of an organisation is a source of transaction exposure as shown by the empirical research findings of Bartram, Brown & Fehle, (2009: 186).

Economic exposure measures the long-term effect of changes in exchange rates related to the value of an organisation (Correia et al., 2007: 19–18). Arnold (2002: 981) suggests that foreign competitors can gain sales at the expense of an organisation whose home currency has strengthened, or at the expense of foreign competitors whose home currency has weakened. Pritamani, Shome and Singal (2005: 87) consider that economic exposure has a combined effect on the competitiveness and transaction ability of organisations. Economic exposure is sometimes termed operating exposure or strategic exposure (Crum et al., 2005: 472) as its effect is on the value of the organisation. Martin and Mauer (2003: 437) suggest that more focus should be given to economic risk as it has a more destructive effect on the organisation than transactional exposure.

Translation exposure, on the other hand, occurs when overseas business units' financial statements are consolidated into the group's financial statement (Buckley,

2004:173). Put another way, translation exposure occurs when assets, liabilities and profit statements are converted from the operation's currencies to that of a reporting currency (Horcher, 2005:30).

#### 3.2.2.10 Local political and regulatory factors (compliance risk)

The oil industry's results can be adversely affected by political or regulatory developments affecting operations. A list of such developments follows.

- Access limitation: in order to gain access to oil resources in Nigeria, companies must have an oil and gas concession licence.
- Legal uncertainty: the much-awaited Petroleum Industry Bill is putting both oil companies and the communities on edge (Adangor, 2016: 2).
- Climate change and greenhouse gas restriction: Nigeria, as a member of the Kyoto Protocol, has measures in place to restrict greenhouse emissions and other regulations on environmental standards for petroleum organisations to comply with. But because of failure to follow through with these commitments in the Niger Delta, the international oil companies operate below environmental standards set even by themselves (Lugard, 2013: 108).
- The industry is required to pay a number of taxes in Nigeria (David-West, 2013: 8–15).

- The operators also face peculiar challenges in Nigeria such as the need to meet the nonstop demands of oil-producing communities for development programmes in their areas, which have led to disruptions in operations from time to time, oil infrastructure destruction, oil theft, and kidnapping of expatriates (Paki & Ebienu, 2011: 140; Njoku, 2016: 47).

#### 3.2.2.11 Strategic risk exposure

Strategic risk exposure is the exposure to competitors, innovations, new technology, and changes in customers' tastes (Andersen & Schroder, 2010: 79). Andersen (2009: 354) believes that exposure related to strategic risks is not easy to quantify because the inferred changes are irregular, sudden, and unique to the organisation. The competitive environment of the oil industry in Nigeria has shifted as new entrants and state oil companies now compete with the major oil companies, and because of changes in technology and consumers' tastes, especially now that emphasis is being placed on renewable energy. Doff (2008: 320) also sees business risk as a fluctuation in earnings resulting from changes in the competitive environment or the extent to which the organisation can timeously adapt to these changes by external stakeholders. Gates (2006: 82) identifies the following seven strategic risks facing organisations in the petroleum sector: industry margin squeezes, technology shift, brand erosion, market stagnation, stiff competition, customer priority shift, and new project failure.

The next section is devoted to a discussion of ways in which the identified risks have impacted on the industry.

### **3.3 FINANCIAL RISKS AND THEIR IMPACT ON THE PETROLEUM INDUSTRY**

This section outlines the literature on how financial risk factors have affected both the petroleum industry organisations, and specific key operational indicators.

#### **3.3.1 Impact on profitability**

The reduced oil price has put pressure on profit margins (Gates, 2006: 82). The value of oil companies' equities varies with oil prices because oil price instabilities directly upset incomes, profits, capital expenditure and cash flows (Boyer & Fillion, 2007: 433). Transaction exposure impacts directly on the profitability of the petroleum sector companies, hence the need to manage these risks properly for the survival of these organisations (Pike & Neale, 2006: 598).

#### **3.3.2 Impact on cash flow**

Foreign exchange risks mostly affect businesses like the petroleum sector of Nigeria which trade internationally as it disturbs the cash flows, sales and competitive position in the product market (Bartram et al., 2010: 148).

### **3.3.3 Impact on cost of doing business**

The shortage of equipment in the country means that companies have to source internationally, which mostly leads to cost escalations in the petroleum industry as the Naira is continuously depreciating against major currencies (Bigliani, 2013: 3). Moreover, owing to the long-term nature of oil projects, the exchange rates could create unanticipated changes in the cost structure of these projects (Fernandes et al., 2010: 1). The scaling back of loans to petroleum companies by banks and corporate bond investors as a result of the downturn in oil prices could intensify pressures associated with deteriorating income and heightened interest costs (IMF 2015: 30).

### **3.3.4 Impact on liquidity**

The IMF (2015: 6) reported that the petroleum industry amassed substantial debt during the periods of high oil prices, which led banks to increase loan credits to oil companies. Also, the prolonged period of low oil prices which has led to high interest rates, has put at risk the debt-servicing capacity of exploration and production petroleum organisations (IMF, 2015: 30).

### **3.3.5 Impact on value of equity**

Crum et al. (2005: 472) state that financial risk factors which affect the value of the organisations, come from the macro-economic environment such as exchange rates, interest rates, commodity prices, and competitors' response to issues on a long-term



basis. Hammoudeh and Li (2005: 1) find that there is a significant positive relationship between oil price sensitivity and oil industry equity. Moreover, oil industry share prices increase when the oil price rises, and they drop when the oil price drops.

### **3.3.6 Impact on workforce cutting**

The Halliburton is an example of an oil organisation that has cut an estimated 29,000 of its workforce worldwide due to the plummeting crude price, leading to two Nigerian unions halting work at their operation in Nigeria (Bloomberg, 2015). Financial risks affect the ability of these companies to source and keep a skilled workforce and to engage in research and development (Shell, 2011: 13).

### **3.3.7 Impact on capital expenditure**

A reduction of lending to highly indebted petroleum companies may have effects on capital expenditure for the development of oil wells (IMF 2015: 30). The CBN has given directives to banks on how to manage their substantial exposure to oil companies in Nigeria as a result of falling oil prices and in the absence of effective risk management, as revealed by the CBN's risk supervision (CBN, 2014: 1–6a).

The preceding discussion shows that financial risk effects are interconnected as price risk is related to exchange risk, exchange risk is related to cash flow reduction, cash flow risk is related to interest rate risk and interest rate risk is related to credit default

risk. Therefore, the best way to strategically manage these risks is through integration, not individually and independent of each other.

The next section suggests how the identified risks facing the industry could be managed.

### **3.4 FINANCIAL RISK MANAGEMENT CHALLENGES IN THE INDUSTRY**

This section surveys the literatures on FRM and challenges facing the petroleum industry in the process of managing financial risks.

#### **3.4.1 Management defined**

Management is the application of understanding, expertise and tools to planning, organising, leading and controlling business undertakings to ensure the attainment of set aims (Du Toit et al., 2010: 172). In the context of this study, management is the process of evaluating petroleum industry financial risks, opportunities and threats, strength and weaknesses, with the aim of identifying, evaluating, planning, communicating, mitigating and reviewing of the FRM management process to determine the lesson learnt.

#### **3.4.2 Defining financial risk management**

FRM is the effort put in by the petroleum industry people to minimise the effect of financial risks of loss stemming from unfavourable movements in currency exchange

rates, interest rates, and commodity prices that may include lending and borrowing in different currencies, options, futures, forwards, swaps and internal strategies (Gitman & Zutter, 2012: 742). It is the plan of action to diminish downside financial risks and boost upside financial risks for the survival of organisations in the petroleum sector of Nigeria.

### **3.4.3 FRM challenges in the petroleum industry**

This segment discusses the various FRM strategies in the Nigerian petroleum industry.

#### **3.4.3.1 Centralised management**

McKinsey (2014: 7) finding indicates that oil companies utilised sophisticated methods in the management of logistics and the supply chain, but when it comes to enterprise risk management, simple techniques are used to deal with individual risks. McKinsey (2014: 17) suggests that a decentralised risk management system should be used in order to increase the skills and understanding of the risk management process of line functions.

The utilisation of a centralised risk management system removes the process from the originators of these risks, and makes the FRM process incomprehensible to the originators. When risk management is too centralised, it removes the need to develop capabilities in the functional business areas and render the system of risk

management ineffective. Moreover, some of the oil companies have set out risk appetites (that is the nature of risks that an organisation wishes to take) without setting limits which have made the operationalising of the risk appetites very difficult (McKinsey, 2014: 8).

#### 3.4.3.2 Lack of cooperative financial risk management

While most of the petroleum sector companies in Nigeria are managing financial risks, they do so without an organisation-wide focus, but on a departmental basis, leading to fragmented efforts (Oracle, 2009: 3; KPMG, 2011: 5). Oracle (2009) adds that companies rarely approach risk management proactively but are reactive, without having alternative plans to mitigate the various risks when they actually become issues. FRM today should be an all-inclusive organisation-wide approach instead of the isolated method being currently used by some in the industry (Fadun, 2013: 69). Those who manage financial risks have no power to influence the strategic direction of the oil organisation due to lack of understanding, or to lack of inclusion in strategy decision-making committees (KPMG, 2011: 6).

The deputy governor of the CBN, Dr Maghalu, is of the opinion that risk management, which is in its rudimentary stage in Nigeria, is beset with a number of challenges. Topmost among them is the severe scarcity of knowledgeable and skilled risk professionals. In addition, there is a poor understanding of risk management by the companies' boards, which should be the authority to direct the risk management processes. When risk management is organised in a strategic direction, and with

strategic plans, it enhances the achievement of more value creation in the organisation, according to Oracle (2009: 3). However, this is not the case in Nigeria's oil and petroleum sector, as indicated by the KPMG (2011: 6) survey on emerging economies, including the petroleum industry.

Zuofa and Ochieng's (2014: 371–372) findings showed several obstacles to effective risk management in the Nigerian oil industry. Chief among these obstacles were concentration on safety, security and health issues, unfamiliarity with fundamental risk management principles, lack of integrations for effectiveness, incompetent staff, absences of risk management culture, lack of frequent training, and the fact that risk management is still a novel practice in Nigeria,.

#### 3.4.3.3 Use of mathematical models

Those who manage financial risks in the industry mostly utilise and rely on financial models, which are only understood to a limited degree by those who are not mathematically inclined. As a result, there is no meeting of minds between management and the risk management section (Buehler, Freeman & Hulme, 2008: 1). Mikes (2009: 18) warns of the danger of the barrier of communication between the two opposing cultures in FRM, namely calculative culture and qualitative culture. If individuals in the various departments of the organisation cannot communicate with one another, then FRM cannot be effective (Crouhy, et al., 2006: 15; Servaes, Tamayo & Tufano. 2009: 60).

#### 3.4.3.4 Lack of coordinated perception of financial risk

The perception of FRM in the industry differs from one person to another, thereby hampering coordinated management of these risk factors (Zuofa & Ochieng, 2014: 371). The KPMG (2011: 5) survey results show that the board's opinion of financial risk is different from the chief operating officer's opinion, or that of the functional heads. The mention of financial risk draws attention in the industry to the use of the derivative, even when Mian (1996: 420), KPMG (2008: 6) and Landsberg (2011: 7) warn that the use of the derivative is just a small portion of the FRM system, and that risk calculation is not management. Soyemi, Ogunleye and Ashogbon, (2014: 347) suggest that FRM should focus on the use of derivatives and non-derivative instruments to control the effect of these risks. Moreover, financial risk (exchange rates, interest rates and commodity prices risks) have not been viewed as having connectivity to operational risks, compliance risks, strategic risks, geological risks, and legal risks (Smith & Fischbacher, 2009: 2). In other words, financial risks are symptoms of other underlying factors that are found in other functional areas of the organisation. Therefore, the managers of these risks need cooperation from other sectors of the petroleum organisation business unit.

#### 3.4.3.5 Other reported challenges

IBM (2004: 2) reiterates that petroleum companies have more challenges than any other industries, as they are faced with a more diverse set of risk factors, such as lack of knowledge capital, of financial capital, and of regulatory frameworks. IBM notes that

the speedy and successful collecting, disseminating, and analysing of pertinent information for FRM in the offshore environment is difficult.

The Nigerian situation is complicated by lack of development of the derivative financial market and other challenges outlined by the deputy governor of the CBN, Dr Maghalu. These include a shortage of risk experts, lack of involvement of the few skilled financial risk managers in strategic decision-making, poor knowledge of risk management by board members, the lack of linkage of risk management with strategic decision-making, the absence of training institutions, and the lack of talent development. Impediments to strategic FRM include inadequate financial and legal infrastructure, a poor range of financial instruments, negative perception of derivatives, and a lack of liquid markets, government policies and creditworthiness (Sharma, Trivedi & Chandak, 2005: 277). In addition, the oil industry, gives greater emphasis on the management of risks that relate to health, safety, security and environment, to the detriment of other risk factors (Zuofa & Ochieng, 2014: 371).

Even when the importance of an integrated system of FRM is broadly documented, some companies in the industry still practise a traditionally segmented approach to risk measurement and control (Cumming & Hirtle, 2001: 1; Fadun, 2012: 226). As a result of this method of FRM being deployed, the development of a risk culture that involves everyone is not very common in this industry. Most people do not understand what financial risk is about, nor do they understand the consequence of it not being managed effectively, especially at the lower levels where the majority of the daily activities are performed (Galloway & Funston 2000: 22). Therefore, enhancing

capacity is a must if risk is to be managed effectively (Galloway & Funston, 2000: 23). A survey on risk management conducted by KPMG (2011: 5–6) on emerging market companies (South Africa, India, Nigeria and the United Kingdom), showed the following trends:

- embedding a strong risk culture is still in its infancy;
- risk management linkage to strategy has a long way to go;
- risk officers do not partake in strategic decision-making;
- there is limited understanding that financial risks symptoms can originate from operational risk factors;
- directors' opinions of what constitutes risk are somewhat different from those of chief operating officers; and
- the boards are not performing their oversight responsibility properly

The next section discusses various aspects of the FRM framework.

### **3.5 THEORITICAL FRAMEWORK**

This section discusses the existing risk management framework with a view to developing a conceptual framework for the petroleum industry of Nigeria.

#### **3.5.1 Models of financial risk management**

A risk is uncertainty that has not materialised; most organisations do not know for sure whether it will result in downside risk or upside risk. Therefore, a strategic FRM framework is about planning for the consequences of risk before it happens so that



organisations in the oil and gas sector of Nigeria can achieve their objectives of being in business. The risk management process is to enable organisations overcome obstacles in the day-to-day running of their business entities systematically (Kallman & Maric, 2004: 57). It involves the analysis of the internal and external environments of the business (Horcher, 2005: 7). If there is any industry that needs to manage financial risk, it is the oil industry where these risks are creating uncertainty of earnings and survival. It makes business sense to take calculated risks to avoid the collapse of business undertakings (Damodaran, 2008: 376).

FRM involves the ability to scan the internal and external environments where these financial risks can occur, thereby including the strategic angle to the risk management strategy (Andersen & Schroder, 2010: 79). Strategic financial risks in the petroleum industry can occur within the companies as a result of transactions and negotiations or outside the organisations as result of market prices or internal actions or failures, especially from people, process, and use of technology (Sharma et al., 2005: 276). It will be necessary to look at the product, management, suppliers, customers, industry, competitors, and position of the organisation in the market in relation to competitors, employees, government rules and regulations, shareholders' expected return, and risk tolerance for the oil sector or organisation (Horcher, 2005: 7).

As the environment is dynamic, so must the risk management process be flexible and not only be concentrated in the finance department (Horcher, 2005: 6–7). Hence, there is a need for an integrated understanding of the process by employees in sales, legal, marketing, corporate finance and treasury in order to align risks management

objectives to the overall mission of the organisation (Andersen & Schroder, 2010: 129). Andersen and Schroder (2010: 129) add that if there is no strategic link to the risk management objective then it is just a drill exercise. Despite the fact that risk management has become an integrated part of business management, there is no standard to which reference can be made for technique, factors and approaches Merna and AL-Thani (2008: 44), especially for non-financial organisations in Nigeria (Fadun, 2012: 227).

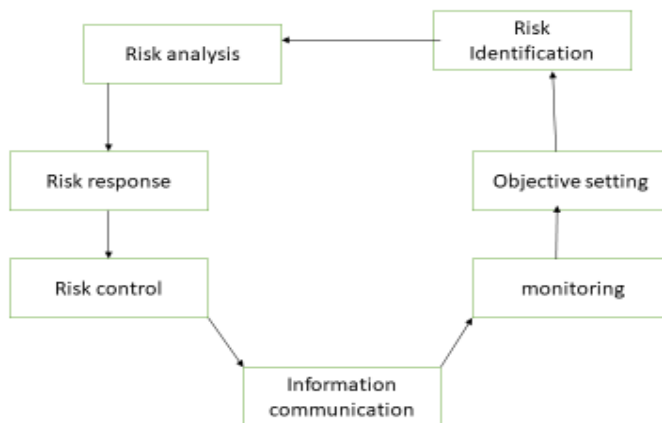
Kallman and Maric (2004: 58) argue that there is no standardised risk management process or model developed for managers of risk to follow. As a result, many frameworks of the risk management process exist, mostly textbooks. Kallman and Maric (2004: 58) suggest that the possible reason for so many models is because risk management stretches across various disciplines and the theory of risk management is evolving towards more descriptive models. Fadun (2012: 227), Raz, and Hillson, (2005: 53) also state that there are various enterprise risk management (ERM) frameworks developed in recent years to promote risk management effectiveness, some of which come from standard organisations.

It is necessary to do a risk profiling of an organisation from competitors, the product market, as well as macroeconomic forces before embarking on risk management (Damodaran, 2008: 309). Pike and Neale (2006: 330) are of the opinion that before one can manage risk, one needs to have made a comprehensive study to identify all the risks facing an organisation, and to have evaluated these risks before the actual management process. These authors identify three risk management stages: identify

risk exposures, evaluate risks and manage risks. The Federation of the European Risks Management Association (FERMA, 2003: 3–11) argues that risk management strategy starts with the organisation’s strategic objective, risk assessment, risk analysis, risk evaluation, risk reporting/communication, risk treatment and monitoring of management process.

As a consequence of the lack of literature on strategic FRM frameworks in the empirical studies, this study has borrowed from ERM, ORM, and SRM to develop the conceptual framework for this study. The Committee of Sponsoring Organisations of the Treadway Commission (COSO, 2004: 5) developed the enterprise risk management framework in 2004.

**Figure 3.3 THE COSO GENERIC ERM MODEL**



Sources: Adapted from COSO ERM framework (2014)

COSO (2004:1-16) The ERM model proposes an eight-stage risk management process: the internal environment, objectives setting, event identification, risk assessment, risk response, control activities, information and communication, and monitoring. These stages are expanded below.

- *Internal environment context*

The internal environmental situation of a petroleum organisation sets out the dos and don'ts as far as risk management in the oil and gas sector is concerned. COSO (2004: 3) places the responsibility of institutionalising suitable policies, supervising implementation and ensuring answerability, objectivity and transparency of the risk management process on the board of directors. The executives manage the resources of the organisation in achieving the organisation's goals set by the board (IRM, 2010: 4). The rest of the oil industry employees are expected to exhibit proficient, honest and ethical behaviour, as directed by the board (Rogachev, 2008: 79).

- *Objective setting*

The risk management process requires strategic, tactical and operational risk objectives to be set before dealing with various risks facing the organisation (COSO, 2004: 3). This is consequential to the fact that every business decision, whether to seek new oil wells, markets, customers, products or equipment, is inherently risky (DeLoach & Thomson, 2014: 9). It is not enough for management simply to set objectives. The objectives must be disseminated, supervised and reviewed regularly,

depending on the risks factors faced by the organisation, for the process to be effective.

- *Risk identification*

COSO (2004: 4) suggests that all events that may have a potential impact on the organisation's objectives must be identified for enterprise risk planning. Stulz (2008: 7) is of the view that it is impossible to manage a risk if one has no knowledge of where it exists. This step is therefore important. All an oil and gas organisation needs to do at this stage is to develop an up-to-date list of particular events that, if they transpire, could sway business outcomes (O'Donnell, 2005: 185).

- *Risk assessment*

This stage allows oil companies to evaluate the impact of the identified financial risks on the organisation's objectives, whether positive or negative. When assessing the likely impact of FRM on the objective of an organisation, it is advisable to assess on an inherent and a residual basis (COSO, 2004: 4). These identified risks should be applied to factors such as the probability of occurrence, the harshness of effect, the rapidity of effect, the persistence of effect, and response readiness to investigate and rank these risks (DeLoach & Thomson, 2014: 10).

- *Risk response*

Effective risk response is the ultimate goal of the framework, in order for the implementation to work effectively (Rogachev, 2008: 79). Risks that guide principles, and processes describing obligation and authority must be effectively communicated (Soyemi, Ogunleye & Ashogbon, 2014: 347). Risk response entails an evaluation and selection of possible alternatives for reducing risk to an acceptable level. Rogachev (2008: 79) suggests these possible responses: avoidance, acceptance, reduction, transfer and risk sharing.

- *Risk control*

Guidelines on the flow of activities and delegation must be established to help ensure that responses are efficiently carried out (Rogachev, 2008: 79). The risk limits, culture, authority and accountability established at the risk context stage will guide the process of control to see if the implementation is being effected according to plans (Soyemi et al., 2014: 347). After mitigation, there is a need to evaluate outcomes to see if they are in line with plans. If there is a variance then corrective action must be taken, otherwise the process will start all-over.

- *Risk information and communication*

Timely and relevant information is the cornerstone of a risk management system as it permeates all aspects of the FRM process, from the establishment of context to

carrying out of responsibilities (Rogachev, 2008: 79). In the COSO framework, financial and nonfinancial information are central to all parts of the business. The oil industry needs risk management information to free flow downward, across and upward for the effectiveness of the process in helping personnel carry out their responsibilities and provide feedback.

- *Risk monitoring*

Finally, to govern the FRM process, the oil organisation must establish a programme for monitoring the implementation and effectiveness of the whole process. An effective management information system to monitor risk level, and expedite timely reviews of the risk position is necessary (Soyemi et al., 2014: 347). Monitoring allows businesses to react proactively to the ever-changing conditions that warrant FRM in the first place and that call for ongoing management activities (Rogachev, 2008: 80).

### 3.5.2 Various risk management standardisation models

The importance of strategic FRM has propelled many institutions to formulate FRM frameworks to guide the process of risk management. Risk management standardisation has become commonplace to deal with the negative effect of risk on the organisation's ability to achieve set out objectives (IRM, 2010). However, strategic FRM has come a long way to include the positive effect of risks on the objectives of the organisation. In developing a conceptual framework, the various standardised risk

management stages are compared to select what is relevant to the oil industry of Nigeria.

**Table 3.2: COMPARISON OF STANDARD RISK MANAGEMENT STAGES**

<p><b>The Australian and New Zealand Standard AS/NZS 4360:2004 and 2011 on Risk Management divided into framework and process</b></p> <p><b>Process</b></p> <ul style="list-style-type: none"> <li>○ Establish context</li> <li>○ Risk assessment</li> <li>○ Risk identification</li> <li>○ Risk analysis</li> <li>○ Risk evaluation</li> <li>○ Communication and consultation</li> <li>○ Monitoring and review</li> </ul> <p><b>Framework</b></p> <ul style="list-style-type: none"> <li>○ Mandate and commitment</li> <li>○ Designating a framework for managing risk</li> <li>○ Implement risk management</li> <li>○ Continue improvement and</li> <li>○ Monitors <ul style="list-style-type: none"> <li>○ CLAUSES</li> </ul> </li> </ul>	<p><b>Chartered Institute of Risk Management (IRM) 2002 framework ISO/IEC 73 of UK</b></p> <ul style="list-style-type: none"> <li>○ The organisational strategic objectives</li> <li>○ Risk assessment</li> <li>○ Risk identification</li> <li>○ Risk description</li> <li>○ Risk estimation</li> <li>○ Risk evaluation, risk reporting for threat and opportunity</li> <li>○ Decision</li> <li>○ Risk treatment</li> <li>○ Residual risk reporting</li> <li>○ Monitor through audit and modification</li> </ul>	<p><b>Federation of European Risk Management Association (FEMA) 2009 ISO31000</b></p> <p><b>Process</b></p> <ul style="list-style-type: none"> <li>○ Establish context</li> <li>○ Risk assessment</li> <li>○ Risk Identification</li> <li>○ Risk Analysis</li> <li>○ Risk evaluation</li> <li>○ Risk treatment</li> <li>○ Monitoring and review</li> <li>○ Communication and consultation</li> </ul> <p><b>Framework</b></p> <ul style="list-style-type: none"> <li>○ Mandate and commitment</li> <li>○ Design of framework</li> <li>○ Implement the framework</li> <li>○ Monitor and review framework</li> <li>○ Improve framework</li> </ul>
<p><b>COSO 2004</b></p> <ul style="list-style-type: none"> <li>○ Internal environment</li> <li>○ Objective setting</li> </ul>	<p><b>Canadian risk 2000: CAN/CSA-Q850-97</b></p>	<p><b>Central Bank of Nigeria (CBN 2008)</b></p> <ul style="list-style-type: none"> <li>○ Identify risks</li> <li>○ Measurement system</li> </ul>



<ul style="list-style-type: none"> <li>○ Event identification</li> <li>○ Risk assessment</li> <li>○ Risk response</li> <li>○ Control activities</li> <li>○ Info/communication</li> <li>○ Monitor</li> </ul>	<p><b>management process</b></p> <ul style="list-style-type: none"> <li>○ Identification of the issue;</li> <li>○ Analysis or assessment of the issue;</li> <li>○ Development of options;</li> <li>○ decision;</li> <li>○ Implementation of the decision; and,</li> <li>○ Evaluation and review of the decision</li> </ul>	<ul style="list-style-type: none"> <li>○ Establish policy, risk appetite and risk limits</li> <li>○ Develop tolerance limit</li> <li>○ Monitor against approval</li> <li>○ Report to top management and disclosure in annual report</li> </ul>
<p><b>AIRMIC, ALARM, IRM 2010</b></p> <ul style="list-style-type: none"> <li>○ Establish context</li> <li>○ Risk assessment</li> <li>○ Risk analysis</li> <li>○ Risk evaluation</li> <li>○ Risk treatment</li> <li>○ Monitoring and reviewing</li> <li>○ Communication and consultation</li> </ul>		<p><b>The King Code<sup>1</sup>V of South Africa</b></p> <ul style="list-style-type: none"> <li>○ Board’s responsibility for risk governance</li> <li>○ periodic, independent assurance on the effectiveness</li> <li>○ Treat risk as integral part of decision making</li> <li>○ Set policy and risk tolerance</li> <li>○ Review the implementation</li> <li>○ Monitor that risks taken are within the limit</li> </ul>

The appraisal of the various standard processes or steps of risk management showed some similarities in the principles outlined. The common factors are the establishment of context or planning, identification, assessment or analysis, treatment or mitigation, and control. The need for continuous communication and monitoring is another recurring principle. However, the Chartered Institute of Risk Management’s model

included strategic objectives while COSO adds objectives to direct the risk management process. FERMA does not have a section dealing with objectives setting. The Australian/New Zealand and FERMA models are broken up into “process” and “framework” sections to detail the principles of a risk management system which are: mandate and commitment, the design of framework, implement, monitor, review framework and improve the framework. They also outline the benefits of the whole system if operated as it should be. The COSO model is the only one which addresses the limitation of the framework with regard to human error, bypassing of the process by management, and cost of the risk response process. However, these should be regarded as generic because implementation is not easy in that organisations’ profiles differ across the various industries (IRM, 2010: 5).

### **3.5.3 Non-standardised risk management frameworks**

Power (2009: 849) views the COSO risk management approach as one which adopts a top-down organisational method to manage the entire array of risks. Generally, the Institute of Risk Management (IRM, 2010: 12) is of the view that there is an assortment of risk management frameworks for explaining and operationalising the ERM system. In developing a conceptual framework that benefits the oil sector of Nigeria, it is necessary to examine the available literature on various risk management frameworks.

Kallman and Maric (2004: 59) propose a five-stage model comprising risk programme development, risk analysis, solution analysis, decision process, and system

administration, each with three sub-steps. Aabo, Fraser and Simkins (2005: 65) suggest an eight-stage model: the establishment of business context, identifying risk, accessing risks, control, assessing current control, tolerable risk, mitigate/treat risk, monitor and review and communicate and consult. Horcher (2005: 7) recommends that the risk management process start with identifying and prioritising the financial risks, followed by appropriate strategy implementation in conjunction with a risks management policy of the organisation. Frigo and Anderson (2011: 85) suggest a six-stage strategic risk management framework: the assessment of organisational risk management effort, strategic risk assessment of internal and external risks, identification, measurement, management, and monitoring and development of the continuous process.

Crouhy, Dan and Galai (2006: 2) argue that risk management should include these seven steps: identification of risk, measurement and estimation of risk factors, assessment of the magnitude of exposure, finding instruments to transfer, assessment of costs and benefits, taking action, and evaluating whether the action taken was worthwhile. Damodaran (2008: 309) proposes a four-stage risk management process starting from listing all risks without reference to the type of risks, categorising them, analysing them and then examining alternatives available to managers. Bradley (2011: 17-30) suggests the following stages in the risk management process: establish context, risk identification, risk analysis, risk evaluation, risk treatment, monitoring and review, then communication and consultation. Fadun (2012: 228) utilised a seven-stage risk management framework.

**Table 3.3 COMPARATIVE NON-STANDARDISED RISK MANAGEMENT STAGES**

Stages	FERMA, 2003	COSO 2004	Kallman & MARIC, 2004	Crouhy et al., 2014	Fadun 2012	Damodaran 2008	Aabo, et al., 2005	Frigo & Anderson, 2011
1 Policy assessment								X
2 Internal Environment Context	x	x	x		x		x	x
3 Objective Setting	x	x						x
4 Event identify	x	x		x	x	x	x	x
5 Risk Categorisation						x		
6 Risk assessment and evaluation	x	x	x	x	x	x	x	x
7 Response and manage	x	x	x	x	x	x	x	x
8 Oversight & control activities	x	x	x	x			x	x
9 Information & communication	x	x	x	x	x		x	
10 Monitoring	x	x		x	x		x	x

From the above analysis of various risk management stages, it appears that most authors utilise the COSO framework for application in risk management. Others modify the stages to fit the particular risk under discussion, as the subject of risk management touches on many disciplines (Kallman & Maric, 2004: 59). Even though the risks management stages are delineated independently, the process is a continual one (AS/NZS, 2011: 51). The researcher in the current study considers, this list to be a

complete FRM framework stages model that may be applicable to the oil and gas industry in Nigeria. The 10-stage risk management framework is therefore employed in this study. The next section looked literature on critical success factors in the process of risk management.

### **3.6. CRITICAL SUCCESS FACTORS**

This section reviews the literature on critical success factors that could be applied to the Nigerian petroleum industry framework.

Oracle (2009: 3–4) outlines certain indispensable independent variables that will enable the success of a risk management framework, which are; commitment by the top executive to risk management, harmonised risk management activities, risk management that is predictive and not only reactive; and alignment of strategic planning and risk management. Zhao, Hwang and Low's (2013:1199) research results on risk management procedures for organisations found the following factors to be crucial for the effectiveness of the framework: commitment and backing from top management, communication, culture, organisational structure, training and development, information technology, and trust. Woon, Azizan, and Samad (2011:37) postulate that a corporation benefits from ERM only when they implement certain critical success factors.

The COSO (2009:1) process identifies the following independent variables as critical success factors for the risk management process: top management, incremental

framework, leverage of existing resources, building on existing ERM, entrenching a risk frame into the business fabric, and providing ongoing risk management updates and unending training for directors and senior management.

Yaraghi and Langhe (2011:556–557) identify 19 critical success factors for a risk management system. These are: business type, communication, consultants, documentation, education, environment, general management skills, leadership, organisational culture, organisational structure, performance reporting, process design, project management skills, reward and recognition, team building, and top management support. Some of these independent characteristics of an effective risk management framework for the oil industry will be expanded here.

### **3.6.1 Top management support**

For the FRM system of any organisation to succeed, there must be top management support of the risk management process. COSO (2004:6), the South African King Code 1V, and the CBN's guidelines all place the responsibility for the risk management process on the directors of the organisation. Ward (2001:8) suggests that top management should direct the development and implementation of the FRM processes throughout the organisation. This is a position supported by Young and Jordan (2008:8) whose research finding shows that top management support is the most important factor for effectiveness in project risk management. Without an unwavering backing by top management for the FRM process, a culture of “anything goes” will prevail (Oracle, 2009: 3; Yaraghi & Langhe, 2011: 559; Manab & Kassim,

2012: 1727). Top management backing permits the executives of an oil organisation to have a better image of the extent of funds exposed to risk and how much profit is being realised (Schiro, 2005:60).

### **3.6.2 Financial risk management structure**

The strategic FRM department needs to be built into the organisational structure, as this structure has a significant effect on the risk management process in fulfilling the objectives of the organisation (Kallman & Maric, 2004: 60). Lessard and Lucea (2008:296) caution against the myth that FRM is the sole responsibility of finance and the use of financial instruments, as most of the worst risk management failures have come from this myth. As there are many aspects of FRM that cut across functional areas, it suggests a flat structure (Damodaran, 2008:376). Hierarchical organisations tend to be inflexible and cannot support a speedy response (Andersen & Schroder, 2010:214). A matrix organisation is a cross-functional structure that promotes the sharing of intellectual property and information between strategic business units (Ryyananen & Salminen, 2014: 705). Functional organisational structure enhances the use of assets, improve flow of information, innovation and collaboration (Dhillon & Gupta, 2015: 53).

### **3.6.3 Financial risk management culture**

Hillson and Murray-Webster (2004: 1) are of the view that the most critical success feature of an FRM is the risk culture. Hashagen (2008: 4); Mike (2009: 18)) decries

the FRM culture that favours calculation only to the detriment of collaboration and dialogue across the organisational structural divide as risk culture affects how members of an organisation perceive risks and their responses. It entails the paramount attitudes, knowledge, beliefs and accepted value about risk, shared leadership and employees of an organisation (Protiviti, 2012: 10) FRM culture motivates, spurs, decreases ineffectiveness, and enables efficiency in the implementation of the framework to achieve business objectives ( Hindson, 2013:4; Protiviti, 2012: 13; Fadun, 2013: 79; Rogachev, 2008: 81). Speculand's (2007: 5) five-year survey across South East Asia finds the culture to be one of the critical success factors for an FRM system. Yaraghi, & Langhe's (2011:576–577) findings also tip culture as a sustainability factor for an FRM.

#### **3.6.4 Communication flow**

All throughout the FRM process in the oil and gas sector, there is a need for effective communication. If individuals in the various departments of the organisation cannot communicate with one another, then risk management cannot be efficient (Crouhy et al., 2006:15). A culture that encourages perpendicular and horizontal communication can improve the risk management effectiveness greatly (Crouhy et al., 2006: 15; Servaes et al., 2009: 60). Communication can be made effective through training and development of staff, workshops, brainstorming and interviews. Study results that support communication as a critical success factor are that of (Speculand, 2007: 5; Zhao et al., 2013: 1199).



### **3.6.5 Information technology resources**

Organisations are increasingly relying on information technology for day to day activities, not to mention the use of these tools in the oil industry of Nigeria. Technological infrastructure is a necessity for the identification, analysis, planning, information dissemination and monitoring of the strategic FRM system (CIMA, 2007:23). Landsberg (2011: 7–8) suggests that technology is a critical success factor.

### **3.6.6 Training and development**

Training in strategic FRM is a necessity for the sustainability of an oil industry in Nigeria. CIMA (2007: 25) is of the view that the suitability of a risk management framework requires some frequent training in the following areas of regulation: nature of financial risks, techniques of identification, reporting system, software, and leveraging of knowledge. Speculand's (2007: 5) study results support the development of the organisation's people through frequent training and reinforcement of required behaviour.

### **3.6.7 Oversight and control**

Proper oversight and control is a prerequisite of an effective risk management system which is the responsibility of board of director of any organisation (Ingley & Walt, 2008: 43). Moody (2006: 3) agrees that the board should play a pivotal role in ensuring that internal oversight and control are effective. Most financial risk management scandals

involving unauthorised risk-taking, emanate from lack of robust oversight and control (KPMG, 2008: 44). Effective oversight and control could have saved Shell Nigeria from the reputational damage for non-recalculation of reserve due to falling oil prices (Dionne & Triki, 2013: 2). An effective oversight and control would have avoided the resignation of Shell group Chairman, the Chief Executive, and the Group Chief Financial Officer of Shell group (Donovan, 2008: 1). Francoise (2009: 371) is of the view that when proper oversight is applied to ERM process, inherent uncertainties are reduced and better objectives achievement.

**In summary:** The preceding literature reviews in sections 3.1 to 3.6. reveal the following as far as FRM in Nigeria's petroleum industry is concerned:

- 1) There are financial risks that are pertinent to the Nigerian petroleum industry. These risks include foreign exchange fluctuation, oil and gas price variability, interest rate changeability, and supply and demand concern.
- 2) These financial risks impact on the Nigerian petroleum industry in specific ways, such as reduction in profitability, cash flow, capital expenditure, and skilled personnel.
- 3) There are particular challenges in managing financial risks in the Nigerian petroleum industry, including lack of capacity building, insufficient awareness of financial risks, wrong perception, and incompetent staff.
- 4) There are guidelines that management needs to put in place for a successful risk management.

- 5) There are critical success factors that should be explored in designing a framework to manage financial risks in the Nigerian petroleum industry. These success factors include: top management support, FRM culture, FRM organisational structure, training and development, information technology and oversight and control.

The next chapter discusses the development of a proposed conceptual framework of the study.

## **CHAPTER 4**

### **TOWARDS A FINANCIAL RISK MANAGEMENT FRAMEWORK FOR NIGERIA'S PETROLEUM INDUSTRY**

#### **4.1 INTRODUCTION**

This chapter integrates the various stages of FRM guidelines discussed in the theoretical section of the study, as being appropriate to the study's main objective: the development of an integrated FRM framework for the Nigerian petroleum industry. This addresses the research gap, which is the absence of an integrated empirical FRM reference framework.

#### **4.2 FINANCIAL RISK MANAGEMENT (FRM) CONCEPTIONAL PLANNING STAGES**

This section discusses in detail the various stages identified in the literature reviewed that could be utilised for successful policy formulation.

##### **4.2.1 Importance of FRM policy appraisal**

The first step in the FRM process is the assessment of whether an oil organisation's policies on strategic FRM are adequate for the dynamic environment in which the oil sector find itself today. It involves the studying of the pertinence of human resource abilities in managing financial risks, the general risk management practices, the

infrastructure and overall procedures in use in the companies (Sangweni, 2003: 11; Frigo & Anderson, 2010: 62). It considers whether boards and management adequately understand the companies' strategic financial risks and the processes of mitigating these risks (Frigo & Anderson, 2010: 62). The need for integration arises because the strategic financial risk does not occur in a vacuum; it involves human resources activities, with the use of technologies and systems that are interconnected to create a network of risks that must be managed holistically (Hashagen, 2008: 2). Schroeder (2014: 28) contends that inability to transform staff manners and attitude, weak governances and poor communication are some of the reasons generally cited for risk management failures. Policy assessment helps in establishing internal context.

#### **4.2.2 Importance of internal and external environment context**

Setting risk management desire or philosophy enables an oil organisation to have the superiority on how FRM should be organised in the organisation. Sangweni (2003: 9–11) is of the view that an organisation should scan the business environment in order to establish certain policies and control measures, such as FRM policies and objectives, to ensure authority, responsibility and accountability for FRM structures. It should further set an appetite, and considers budgets, scope and tolerance levels. Kaplan and Mikes (2012: 54) advocate the development of a mission statement, value system, standards, and audit rules.

There is a need for objectives and policies on how risk should be identified, and information generated, in addition to identifying who will be responsible for managing

risks, a line of reporting, how to audit, and monitoring risk management efforts (Crouhy et al., 2006: 47). The main objectives of the Australian/New Zealand (AS/NZS) Standard ISO 31000 (2011: 18) of establishing context are to decide the limits within which the risk management guideline will operate in order to note and mitigate all financial risks facing the organisation. Environmental scanning should be a recurring event to ensure relevance to the oil and gas industry with regards to FRM (Caldwell, 2012:16).

#### **4.2.3 Importance of risk management objectives and policy-setting**

After setting the context of risk management, the next stage is the determination of the objectives of the risk management system. The risk management process requires strategic, tactical and operational risk objectives to be set before dealing with the various risks facing the organisation (COSO, 2004: 4). Setting of objectives for the FRM system is very important for the Nigerian petroleum sector – without it, members' efforts will be pulling against the overall organisational strategic direction as set by CIMA (2007: 3). Oracle (2009: 5) advocates the setting of goals to be able to address FRM effectively and protect companies against negative risks. Policies assist to illuminate the purposes and aims of the petroleum organisation concerning FRM in the course of its business activities, in apportioning of power and duties to individual members in the realisation of the organisation's goals (Sangweni, 2003: 9). Policy formation affords management the chance to state what they mean by financial risks and what they anticipate to gain through the mitigation effort (Oracle, 2009: 5). Policies

could give direction to the employees on how activities and information should flow in an oil organisation and could be used as a yardstick for performance appraisal.

#### **4.2.4 Importance of risk event identification**

Identification of strategic financial risks that will affect the eventual business operation in the oil and gas sectors depends on the ability of an organisation to recognise the sources or causes of adverse or upside deviations from the expected (CIMA, 2007: 3). Exposure identification is the most important task of the risk management process as one cannot manage an exposure that has not been identified (Corbett, 2004: 54; Stulz, 2008: 41). Companies in the oil and gas sectors can catalogue financial risks applicable to the sector and individual organisation (Thomson Reuters, 2014: 1). The strategic financial risk could be identified in the overall organisation activities, in human resources, business units, departments, ventures, procedures or in the events of an oil organisation (CIMA, 2007: 3). Damodaran (2008: 310) is of the view that although it is not an easy task to identify all the risks that an organisation faces, not knowing them will make it impossible to categorise them, let alone manage them in the most efficient way.

There are a number of techniques available to the oil and gas sector for the identification of the various risks facing it, according to CIMA (2007: 3–8). They are:

***Brainstorming:*** Brainstorming meetings allow the participants to think “outside the box” as they collaborate their efforts to identify financial risks facing the organisation.

In a brainstorming meeting, risks that are recognised and unidentified might surface and sometimes events that people have not thought of previously may emerge as risks facing the organisation (CIMA, 2007: 4). Participants for a brainstorming session should be drawn from various sectors of the organisation and should be given prior notice, as financial risks cut across departmental boundaries.

***Event inventories and loss event data:*** Sometimes constraints that are inherent in a business or an industry are uncovered by assessing bygone catalogues of losses (Kallman & Maric, 2004: 60). Thomson Router (2014: 1) contends that loss information from within or outside an organisation that is pertinent to the industry, is an important source of understanding and identifying an organisation's risks.

***Interviews and self-assessment:*** Just as one can utilise questionnaires to identify the risks being faced by an organisation, one can also use an interview that is addressed to senior management and junior management to identify financial risks facing an oil organisation. Interviews allow individuals to narrate the number of financial risks that might prevent each department from achieving its objective and also help to identify how low or high the unit's risk management capability is (CIMA, 2007).

***Facilitated workshops:*** Sometimes it is necessary for participants to go away to a workshop for discussion, sharing of ideas and knowing those risks with financial implications for an oil organisation (FERMA, 2010: 13).



**SWOT analysis:** Identification of strengths, weaknesses, opportunities and pressures (SWOT) is a powerful strategic FRM tool for the identification of early signs of threats and opportunities in the macro business environment, and of strengths and weaknesses in the micro business environment.

**Risk questionnaires and risk surveys:** Questionnaires can be utilised to reveal exposures, but sometimes they do not disclose specific exposures (Kallman & Maric, 2004: 60). CIMA (2007: 8) suggests that the use of a risks questionnaire that includes events that are within and outside the organisation can help in identifying strategic financial risks as it allows the participants to think through the alternatives to the issues that they are experiencing as risk factors.

**Scenario analysis:** Scenario analysis enables businesses to identify those risks that do not occur frequently and are strategic in nature but create high impact when they do occur (CIMA, 2007: 8). These processes involve the cross-examination of various scenarios that could possibly occur within the organisation, the industry or outside the industry that will affect any oil organisation. Scenario planning can produce insights on developing risk threats and make predictive limitation strategies possible (Oracle, 2009: 4).

**Using technology:** Technology enables managers and staff to do desktop research on various risks that had affected the department or unit before, those that are inherent in the oil industry that might affect them, and those that come from the remote environment (CIMA, 2007: 9). A desktop search on the Eni (2013: 37) Annual Report

shows that low oil prices affect the organisation's financial assets, liabilities or expected future cash flow, up to the point of recalculating the organisation's oil reserve.

**Other techniques:** Financial statement analysis can be used to identify possible risks that are upsetting the organisation (Kallman & Maric, 2004: 60). This process normally yields much exposure to an organisation and consequently necessitates a method for grouping. Caldwell (2012: 18) suggests that there is a need for orderly classification of the above-identified risks in the oil industry to assist the board of directors and those who are responsible for the FRM process.

#### **4.2.5 Importance of risk categorisation**

One of the ways of producing FRM which is effective is to group similar kinds of risks that an establishment is facing (Kaplan & Mikes, 2012: 50). Risks can be categorised in many ways, according to their characteristics or sources (Ernst Young, 2013: 5b). Countrywide, an estate agent, grouped their risk factors as strategic, credit, operational, market and reputation, according to the Institute of Internal Audit, United States of America, as compiled by Roth, Espersen, Swanson and Sobel (2007: 26). Other authors who support risk grouping are Miller (1992: 313), Renn and Klinke (2004:4), CIMA (2007: 12), Andersen and Schroder (2010: 78) and Caldwell (2012:18). The oil industry can group their risk according to sources such as financial, operational, strategic and compliance (Ernst Young, 2011: 5). Bigliani (2013: 3–5)

classified the oil and gas sector's risks as environmental, health, safety, shortage of experts, operational complexity and cyber security.

#### **4.2.6 Importance of risk assessment and alternative planning**

The essence of risk analysis is to understand how high or low a specific risk effect will be rated in terms of the organisation's objectives. CIMA (2007: 12) suggests that proper diagnosis of the drivers of the risk should be done alongside analysis. A chart of the causal factors analysis can be established using scenario analysis and related documentation from risk owners (CIMA, 2007: 10). If the purchase and installation of equipment may result in an increase in cost of doing business for example, a diagnosis investigation should be done for proper strategic alternative plans (Caldwell, 2012: 47) to determine the specific impact that such a risk has on the oil organisation (Bigliani, 2013: 6). Colour coding risks along the lines of severity or through a "heat map" could help risk managers to determine the actual impact (Caldwell, 2012: 45).

CIMA (2007: 12) suggests that risk analysis could be done qualitatively or quantitatively. Qualitative tools are a risk register, risk ranking, risk maps and colour coding, while quantitative tools are the use of probability, net present value, asset at risk, sensitivity analysis, Monte Carlo simulation, value at risk, internal rate of return, cash flow at risk, earning at risk, scenario analysis, return on investment and benchmarking (CIMA, 2007: 12). After assessment of the identified risks, alternative strategic plans should be instituted (Frigo & Anderson, 2009: 30). Planning is a critical

core aspect of the strategic ORM process as it provides great potential for identifying and controlling other procedures in the system (Akpolat & Pitinanondha, 2009: 11).

#### **4.2.7 Importance of risk mitigation**

After the analysis of the strategic financial risks facing the oil and gas sector and having established alternative plans, the next stage is finding a suitable strategy to actually manage the risk (Crouhy, Galai, & Mark, 2005: 49). This depends on the risk appetite of the petroleum organisation, organisational culture, top management commitment and the set objectives or strategic direction of the oil organisation. It may require the creation of awareness, through risk management vision, risk strategy, risk education, risk culture, risk structure, collaboration and integration to the value system of the oil organisation (CIMA, 2007: 24). The implementation of a risk management system should be based on planned objectives, requirements, benefits and resources of the organisation. Kaplan and Mikes (2012: 53) suggest that risk should be managed based on the following categories:

1. Avoid or eliminate preventable risk occurrence cost-effectively;
2. Reduce likelihood and impact of strategic risk cost-effectively; and
3. Reduce impact of external risk cost-effectively should risk event occur.

#### **4.2.8 Importance of oversight and control**

After mitigation, there is a need to appraise the outcome to determine if it is in line with the plan. If there is variance then corrective action should be taken or it should be

taken back to the drawing board (Du Toit et al., 2010: 228). The process of control requires the establishment of standards as shown in the context stage, measurement of mitigation, determining variance, and remedy deviation (Du Toit et al., 2010 228). The risk limits, culture, authority and accountability established at the risk context stage will guide the process of control to ensure that implementation is being effected according to plans (Soyemi et al., 2014 347). The essence of controlling the risk management process ensures that performance is in line with the desired outcome, to adapt to environment changes, to limit errors in the process and to control cost (Du Toit et al., 2010: 228).

#### **4.2.9 Importance of communication flow**

Frigo and Anderson (2009:33) suggest that establishing a common view of financial risk and effectively communicating this to all members of an organisation is central to sustainable FRM. Information that is pertinent, accurate and timely is very critical for strategic FRM. COSO (2004:4) classifies information and communication as the cornerstone of an FRM system. A communication process provides for the building or reinforcing of an oil organisation's risk management culture through information-sharing, education and collaboration in dealing with the various risks (Frigo & Anderson, 2009:33). It is wise for oil companies to benchmark their risk communication system to best practices such as that exhibited by Hydro One (Kaplan & Mikes, 2012:53).

#### **4.2.10 Importance monitoring**

Continuous monitoring of the whole process of FRM is necessary for the survival of an oil organisation operation in Nigeria. This process ensures that there is an early warning system in place to detect any weak link in the FRM process, guarantees that mistakes are not repeated and errors do not accumulate (Crouhy et al., 2006: 54). Monitoring can be done daily, weekly, fortnightly, monthly, bi-annually quarterly or yearly depending on the risk in question. Companies should cultivate an ongoing procedure to periodically update the assessment of a strategic FRM process (Frigo & Anderson, 2011: 61). This process requires the services of independent persons who are not involved in the FRM process to acknowledge and reinforce good strategic FRM behaviour. The ten risk management stages identified in the literature are utilised to develop a proposed framework.

These conclusions from the literature are now carried into the next section which aims is to develop an integrated FRM framework for the Nigerian petroleum industry.

### **4.3 THE PROPOSED FRM FRAMEWORK FOR NIGERIA'S PETROLEUM INDUSTRY**

In the development of a proposed integrated framework to manage financial risks, the present study has identified that certain critical success factors are needed as moderating variables to the success of an FRM framework.

#### **4.3.1 A proper understanding and quantification of the type of financial risks that the petroleum industry faces**

The research question to be answered here is: Do petroleum organisations have a proper understanding of the financial risk that they face and how these risks impact on their organisations and the industry as a whole?

The price of the petroleum industry's main product, which is crude oil, has fallen by nearly 55% since June 2014 owing to over-supply, slow demand triggered by the economic slowdown, and the decision taken by OPEC in 2014 not to cut output. Low oil prices negatively affect the petroleum industry's financial assets, liabilities and reduction of expected future cash flow. Prolonged low oil prices have required companies to recalculate their oil reserve (Heiligtag, Schlosser & Stegemann, 2014: 3). The prolonged low oil price since 2014 to 2016 has resulted in low return, reduced profitability, reduction in skilled workers due to workforce cutting, and increase in the cost of doing business in the Nigerian petroleum. Exchange rate fluctuation has unfavourably affected cash flow, liquidity, rates of borrowing, skills procurement, and cost of oil prospecting and drilling projects. Sometimes it results in the shelving of certain projects whose expected return rates are higher than the current oil price (Consumer News and business Channel [CNBC], 2014: 1).

Increase of costs of doing business in the petroleum industry's multi-billion Naira (N300 to US\$1) projects, whose lifespan is 12–24 months, is always blamed on the depreciating Naira. Payables and receivables in the petroleum industry of Nigeria are

usually at variance from their anticipated value owing to exchange rate fluctuation, which results to reduction in cash flow, workforce cutting, and reduced access to cheap funding, project shelving and eventual organisation liquidation. The essence of management of financial risk strategically in the petroleum industry in Nigeria is to protect organisations from financial distress and to enable oil companies to flourish amid uncertainty (Baldoni, 2001: 13).

A strategic FRM in the petroleum industry Nigeria, required that managers are aware and understand the implications of these abovementioned risk factors which may results to un-achievement of these companies' strategic financial objectives. To assess this understanding, the present study must therefore do the following:

- determine whether there is a consensus on the type of financial risks there are in the industry;
- determine whether a ranking order exists to assess which financial risks are most influential in the industry; and
- determine whether a ranking order exists to assess which financial risks have the highest impact on petroleum organisations.

#### **4.3.2 The relationship between top management support and FRM success**

According to Oracle (2009: 3–4), an indispensable factor that will enable the success of a risk management framework is the commitment of the top executives to risk management. For the FRM system of any organisation to succeed, there must be top



management support of the risk management process (Landsberg, 2011: 7–8). COSO (2004: 6), the South African King Code 1V, and the CBN's guidelines all place the responsibility of the risk management process on the directors of the organisation. Ward (2001: 8) suggests that top management should direct the development and implementation of the FRM processes throughout the organisation. This is a position supported by Young and Jordan (2008: 8) whose research finding shows that top management support is the most important factor for effectiveness in project risk management. Without an unwavering backing by top management for the FRM process, a laissez-faire attitude will prevail (Oracle, 2009 3; Yaraghi & Langhe, 2011: 559; Manab & Kassim, 2012: 1727). Top management backing permits the executives of an oil organisation to have a better understanding of how much of the funding is exposed to risk and how much profit is being realised (Schiro, 2005: 60).

- The present study will therefore investigate the extent to which the top management in Nigerian petroleum companies: is dedicated to the achievement of FRM success, provides support in the formulation of FRM policy, provides sufficient funding in support of FRM success, and takes responsibility for the evaluation and control of the FRM process. These management actives will lead to successful development of policy framework, easy identification of financial risks, and analysis of FRM, mitigation of financial risks, and effective communication and control.

Against the background of the preceding literature review, the following hypothesis will be investigated:

H1 Top management support is positively related to FRM success in the Nigerian petroleum organisations.

#### **4.3.3 The relationship between FRM culture and FRM success**

Landsberg (2011: 7–8) suggests that a culture that supports FRM is required to achieve FRM success. Hillson and Murray-Webster (2004: 1) actually state that the most critical success feature of an FRM is the risk culture. Hashagen (2008: 4) and Mikes (2009: 18) both decry the FRM culture that favours calculation, to the detriment of collaboration and dialogue across the organisational structural divide, as risk culture affects how members of an organisation perceive risks and their responses. It entails the paramount attitudes, knowledge, beliefs and accepted values concerning risk, shared leadership and employees of an organisation (Protiviti, 2012: 10). FRM culture motivates, spurs, decreases ineffectiveness, and enables efficiency in the implementation of the framework to achieve business objectives (Hindson, 2013: 4; Protiviti, 2012: 13; Fadun, 2013: 79; Rogachev, 2008: 81). Speculand's (2007: 5) five-year survey across South East Asia identifies the culture as one of the critical success factors for an FRM system. Yaraghi & Langhe's (2011: 576-577) findings also tip culture as a sustainability factor for an FRM.

A healthy FRM culture enables an organisation to create greater awareness of the importance of FRM, to achieve organisational objectives, to improve decision-making in the financial matters of the organisation, and to increase participation and collaboration on financial matters of the organisation. The present study investigates

to what extent FRM culture in the companies enables achievement of the abovementioned objectives. The following hypothesis will therefore be investigated:

H2 An FRM-supporting culture is positively related to FRM success in the Nigerian petroleum organisations.

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#### **4.3.4 The relationship between communication flow and FRM success**

Throughout the FRM process in the petroleum sector, there is a need for effective communication (Landsberg, 2011: 7–8). If individuals in the various departments of the organisation cannot communicate with one another, then risk management cannot be efficient (Crouhy et al., 2006: 15). A culture that encourages perpendicular and horizontal communication can improve the risk management effectiveness greatly (Crouhy et al., 2006: 15; Servaes et al., 2009: 60). Communication can be made effective through training and development of staff, workshops, brainstorming and interviews. Results of studies by Speculand (2007: 5) and Zhao et al. (2013: 1199) support communication as being a critical success factor for FRM success.

Against this backdrop, the present study investigates to what extent the communication flow on FRM matters has aided Nigerian petroleum companies in timely risk identification, risk policy dissemination, risk decision-making, and implementing risk control measures. The following hypothesis will therefore be investigated:

H3 An FRM-supporting communication flow is positively related to FRM success in Nigerian petroleum organisations.

#### **4.3.5 The relationship between informational technology support and FRM success**

Organisations are increasingly relying on information technology for day-to-day activities, not to mention the use of these tools in the oil industry of Nigeria. Technological infrastructure is a necessity for the identification, analysis, planning, information dissemination and monitoring of the strategic FRM system (CIMA, 2007: 23). Landsberg (2011: 7–8) suggests that information technology is a crucial determinant of a successful FRM framework. Zhao et al. (2013: 1199) agree that effective use of information technology is a crucial factor for the success of a FRM framework. The present study investigates to what extent information technology has aided the following FRM activities: corporate governance, environmental scanning, risk ranking and analysis, and risk mitigation and control.

The present study investigates to what extent information technology has aided in the following FRM activities: corporate governance, environmental scanning, risk ranking and analysis, and risk mitigation and control. To this end, the following hypothesis will be investigated:

H4 FRM-supporting Informational technology support is positively related to FRM success in Nigerian petroleum organisations.

#### **4.3.6 The relationship between organisational structure and FRM success**

The strategic FRM department needs to be built into the organisational structure, because organisation structure has a significant effect on the risk management process in fulfilling the objectives of the organisation (Kallman & Maric, 2004: 60). Landsberg (2011: 7–8) agrees that organisational structure is crucial for a strategic FRM framework. Lessard and Lucea (2009: 296) caution against the myth that FRM is the sole responsibility of finance and the use of financial instruments; many of the worst risk management failures have come about as a result of this myth. As there are many aspects of FRM that cut across functional areas, Damodaran suggests a flat structure (Damodaran, 2008: 376). Hierarchical organisations tend to be inflexible and cannot support a speedy response (Andersen & Schroder, 2010: 214).

Centralisation of organisational structure is the degree of management decisions been taken by few employees at one central unit. The finding of Nandi and Kumar (2016: 728) indicate that a more centralised organisational structure setup, inhabited the effectiveness and success of enterprise resource planning. Less centralised risk management organisation system were preferred as this most of times leads to capacity building, and success of the risk management system (Nandi & Kumar, 2016: 744). According to Kaplan and Mikes (2012: 53), too much centralisation in an FRM system removes the process from those units that generate the risks, concentrating risk management in the hands of a few. This creates misunderstanding of the concept of financial risk throughout these organisations. Centralisation of the process also robs the petroleum industry in Nigeria of the ability to transfer knowledge for capacity

building, from those who are risk professionals, to the other members of the organisation (Kaplan & Mikes, 2012: 53).

Against the background of the preceding literature review, the following hypothesis will be investigated:

H5 A centralised organisational structure is negatively related to FRM success in the Nigerian petroleum organisations.

#### **4.3.7 The relationship between training and FRM success**

Landsberg (2011: 7–8) has identified training as a crucial factor in the effectiveness of an FRM framework. Training in strategic FRM is a necessity for the sustainability of an oil industry in Nigeria (CBN, 2012: 2). In particular, a lack of training institutes for risk professionals creates a lack of risk management knowledge among board members and acute shortages of professional risk experts. This leads to a lack of ability in companies to train their employees in FRM matters (CBN, 2012: 2). The CIMA (2007: 25) is of the view that the suitability of a risk management framework requires some training in the following areas of regulation: nature of financial risks, techniques of identification, reporting system, software, and leveraging of knowledge. Speculand's (2007: 5) study results support the development of the people in the organisation through frequent training and of reinforcement of required behaviour. Lack of frequent training was found to be one of the reasons why project risk management in Nigerian oil and gas industry has not been successful (Zuofa &

Ochieng, 2014: 371-372). Development of risk management capability is suggested to lead to competitive advantage (Elahi, 2013: 128).

The preceding literature review has prompted the formulation of the following hypothesis:

H6 FRM-frequency of supporting training and development is positively related to FRM success in Nigerian petroleum organisations.

#### **4.3.8 The extent to which FRM oversight and control is achieved in Nigerian petroleum industry**

Monitoring (oversight) and control are important activities in all risk management frameworks (COSO, 2004: 1-16; CIMA, 2008: 7; Frigo & Anderson, 2011: 2). Inefficient oversight and control has seen the loss of billions of US dollars in many established business such as Barring Investment Bank, Society Generale Bank, and Sumitomo Corp (KPMG 2008: 44). As result of inefficiency in the management process (owing to unauthorised risk-taking) come waves of scandals and dramatic collapse of many long-established businesses including Metallsgrsellschaft Refining and Marketing and the tarnishing of the image and reputation of Shell Nigeria (Dionne & Triki, 2013: 2). For example, Shell's failure to restate their reserve in Nigeria as a result of falling oil prices led to the resignation of the Group Chairman, the Chief Executive of Shell Exploration and Production, followed by the Group Chief Financial Officer (Donovan, 2008:1). Oversight and control activities ensure that there is a system of early warning

in place to detect any weak link in financial risk management processes. Early warning systems make sure that mistakes are not repeated and that errors do not accumulate (Crouhy et al., 2006: 54).

The present study investigates to what extent oversight and control activities have been successful in protecting Nigerian petroleum companies from risks. By conducting this investigation, the present study will answer the question as to whether successful FRM control and oversight is achieved in Nigerian petroleum industry. The proposition investigated in this regard will be as follows:

P1: Proper FRM oversight and control measures in Nigerian petroleum industry save them from selected risk consequences.

#### **4.3.9 The extent of understanding and proper assessment of important critical success factors for the successful achievement of FRM**

In the previous discussion, the following variables have been identified as important factors for the sustainability of FRM: top management support, organisational structure, FRM culture, communication flow, informational technology, and training and reinforcement and oversight and control. It is important to evaluate whether there is a proper understanding and assessment of the importance of these variables in the achievement of sustainable FRM systems in the Nigerian petroleum companies. In the present study a ranking of importance with regard to these variables is pursued.



In summary: The investigation (quantitatively and qualitatively) of the abovementioned research questions, hypotheses, and proposition enables the current study to produce the following framework to manage financial risks in the Nigerian petroleum industry:

**TABLE 4.1 PROPOSED FRM FRAMEWORK FOR NIGERIAN PETROLEUM INDUSTRY**

NO.	FRM ISSUE	ACTION REQUIRED by organisation
1	The main financial risks that impact on my organisation are: a) ..... b) ..... c) .....	Scan environment regularly for changes/developments as far as these risks are concerned (indices, governmental reports, industry reports, etc.)
2	The abovementioned risks mostly affect my organisation's: a) ..... b) ..... c) .....	Provide for early warning techniques that would indicate that these impacts are occurring and the extent of these impacts. My early warning techniques indicate the following: a) ..... b) ..... c) ..... d) ..... e) .....
3	How does my organisation manage (plan, organise, lead and control) the abovementioned risks?	PLAN a) ..... b) ..... ORGANISE a) ..... b) ..... LEAD a) .....

		b) ..... <b>CONTROL</b> a) ..... b) .....
4	Critical FRM success factors are: a) ..... b) ..... c) .....	My organisation must therefore assess how the following critical success factors are achieved/pursued: a) ..... b) ..... c) .....
5	What are the challenges in achieving FRM success in my organisation? a) ..... b) ..... c) ..... d) ..... e) .....	My organisation must do the following to address these challenges: a) ..... b) ..... c) ..... d) ..... e) .....

#### 4.4 CHAPTER SUMMARY

This chapter explored the proposed integrated financial risk management conceptual framework. It focused on combination of techniques and stages in FRM framework as advanced by contemporary literature. The chapter reviewed the critical success factors needed for a strategic FRM in the petroleum industry. The conclusion of the chapter was with a proposed conceptual framework for a strategic FRM framework. The next chapter outlines the research method which was used in this study.

## CHAPTER 5

### METHODOLOGY OF THE STUDY

#### 5.1 INTRODUCTION

In this chapter, the methodological approach of the study is presented. The chapter outlines the logical sequence of an existing structure on which the present study is based to describe knowledge, the procedures undertaken by the study to generate information and appropriate methodology utilised for the research. A framework for this study was developed utilising a mixed methods as advocated by Creswell (2009: 17). This includes the way in which data was collected and analysed to answer the research questions that were formulated in Chapter 1 (Cooper & Schindler, 2006: 4). The methodological approach described in this chapter enables the researcher to realise the purpose of this study which is to establish a financial risk management framework for the petroleum industry in Nigeria.

Babbie and Mouton (2015) identify three methodological paradigms, namely quantitative, qualitative and participatory action research. These paradigms are located within three research schools or traditions, namely positivism, interpretivism and critical theory.

According to Babbie and Mouton (2015) and Collis and Hussey (2014), various methodological research designs (or approaches) emanate from the three methodological paradigms. From the quantitative paradigm arise the following

research designs: experimental studies, surveys, cross-sectional studies and longitudinal studies. The qualitative paradigm produces research designs such as hermeneutics, surveys through interviews, ethnography, life histories, action research, case studies, and grounded theory. From participatory action research come research designs such as critical feminist, gender and ethnicity studies.

The present study is located in both the positivistic and interpretivistic research traditions, more specifically in the quantitative and qualitative methodological paradigms. From a research design perspective, the study employs a survey design, by mail-surveying target respondents using questionnaires, and surveying subjectively by interviewing and interpreting human action (see Babbie and Mouton, 2015: 249–258) in the petroleum industry of Nigeria. In the next sections, the abovementioned aspects of the present study's research location are discussed in more detail.

## **5.2 THE METHODOLOGICAL PARADIGMS UNDERPINNING THE PRESENT STUDY**

This study operated a mixed method research (MMR) with the philosophical stand that is associated with pragmatism paradigm (Harrison, 2013: 2153). Therefore, the worldview chosen for this study was drawn from the pragmatism worldview, leading to the use of a mixed methods research design.

The reasons for using mixed methods are:

- The nature of the questions that emanated from the conceptual framework;
- For the triangulation of findings;

- For the validation of one data by another;
- To overcome the limitation of either using qualitative or quantitative alone;
- Qualitative data enlightening the discovery's in quantitative; and
- To enhance the integrity of findings.

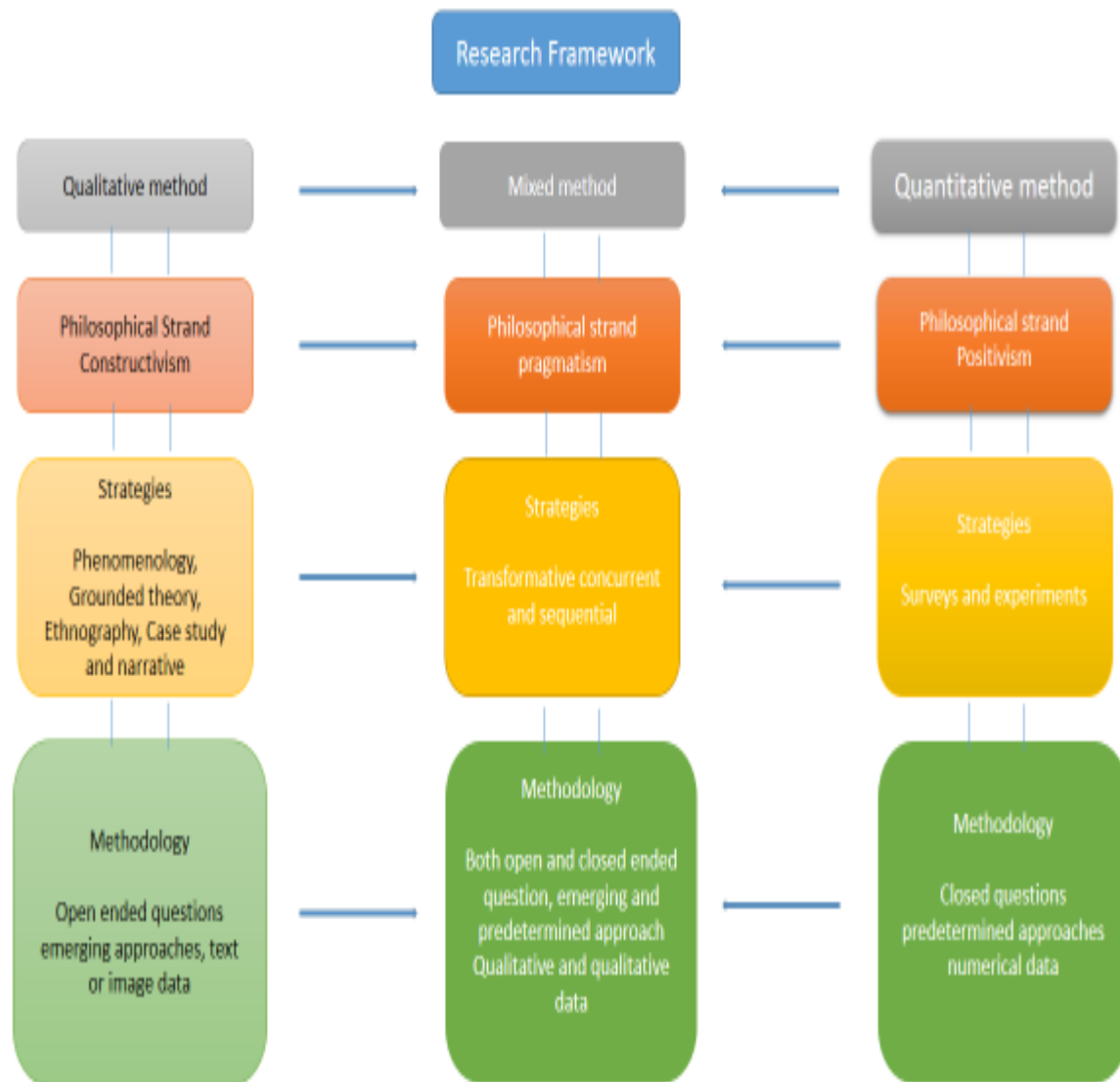
To clarify what the study meant by mixed method research strand, this study utilises the definition given by Johnson, Ownegbueze and Turner (2007: 123):

*Mixed methods research is the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purposes.*

This means that the study employed two instruments in data gathering (qualitative and quantitative), two methods of data analysis (numerical and content analysis) and integrated the results and implications. The study, therefore, employed a mixed research method that includes aspects of deductive paradigm and inductive paradigm and integrates the findings to make an assertion. Deductions are conclusive statements which are impossible to be false while inductions occur where fallible conclusions are drawn from several factors constructively (Cooper & Schindler, 2006: 33). The study's data collection was done simultaneously for both the qualitative and quantitative strands, thereby relating this study to the concurrent convergent aspect of the mixed method research.

To guide the inquiry of this study, the researcher employed the research design framework of Creswell (2009:17) which is a mixed method as shown below.

Figure 5.1. Research theoretical framework



Source: Adapted from Creswell (2009)

Each of the three research methods employed in this study (qualitative, quantitative and mixed) will now be unpacked in detail.

### **5.2.1 Qualitative paradigm**

Research in the qualitative paradigm employs an inductive approach to generate theory, permits plural subjective viewpoints, and constructs assertions instead of testing frameworks about reality (Collis & Hussey, 2014). This paradigm allows researchers to generate information based on how humans interpret their world, upon which theory can be built.

The present study utilised an inductive approach whereby, through semi-structured interviews, information about financial risk factors facing the Nigerian petroleum industry was collected, analysed and interpreted. This placed the study in the interpretivist tradition and qualitative methodological paradigm.

### **5.2.2 Quantitative paradigm**

According to Creswell (2009), the quantitative paradigm is often referred to as the hypothetical–deductive research methodology, or the methodology whereby statistical hypotheses are accepted or rejected. This is so because the quantitative paradigm allows the statistical testing of hypothesised relationships (or associations) between independent and dependent variables. Independent variables are conceptually constructed, measured and hypothesised to explain the movement or variance in the dependent variable. The dependent variable (FRM success) is the attitude or behaviour which the researcher wants to change (usually improve) in order to solve the research problem.

The critical success factors identified in section 1.3 of the study are the independent variables which were constructed in order to investigate their relationship with the dependent variable of FRM success. Responses to questions on both independent and dependent variables were quantified (measured). This allowed for descriptive statistics to be calculated and statistical tests to be conducted on the hypothesised relationships between the variables. This hypothetical–deductive approach places the present study in the quantitative methodological paradigm as well.

### 5.2.3 Mixed method designs

Mixed method research is a study that both qualitative and quantitative data collection and analysis are used in a single study and the results are collaborated to generate knowledge (Harrison, 2013: 2153). Mixed methods studies sometimes begin with an initial research approach, progress through the stages of that approach, and then cross over to a different approach to gain new insights within a single study (Golicic & Davis, 2012: 733).

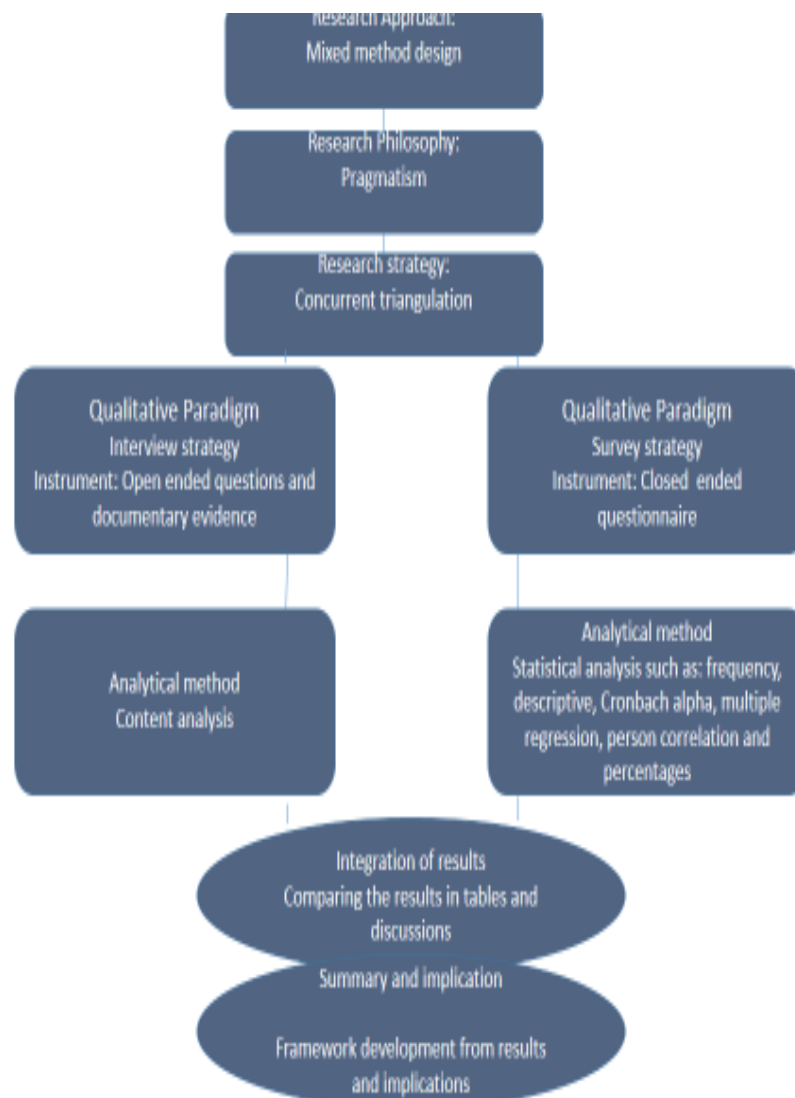
Harrison and Reilly (2011: 20) contend that studies that merely collect both quantitative and qualitative data without integration is a collection of methods and not the mixed method. This study collected quantitative data through survey and qualitative data through interview method, analysed them and integrates the results and draw implications. Mixed methods research (MMR) was employed in this study as an investigation that syndicates numerical and non-numerical data inside the same



study regarding data gathering, evaluation, and inference techniques to collaborate each other as advocated by (Griensven, Moore & Hall, 2014: 367).

After the explanation of the various research paradigms employed in this study and the reasons for doing so, the methodical and analytical framework on which this study is based is now detailed:

**Figure 5.2 Chosen research framework**



### 5.3 STUDY POPULATION

Moore and Klingner (2014:392) citing Kempthorne (1961) define target population "as the larger group of persons with whom the researcher is interested and to whom the researcher intends to generalise finding".. Thus, the target population for this study is the entire financial risk management practitioner in management level in the petroleum industry of Nigeria. Bryman (2012:186) states that when data is collected from every member of the target population, then that particular study utilised a census, but studying of a few individuals of the target population is known as sampling. Moore and Klingner (2014:392) explained that it is necessary for researchers to clearly describe the characteristics of both the sample and the target populations. Thus, the following characterised the target population for this study:

- The targeted individual must be a person working in the petroleum sectors;
- Must be knowledgeable in the risk management and practising;
- Must be a management staff, in the upper, middle or lower level;
- Experts are those on top management level.

Since there is no list of only financial risk management staff in the petroleum industry anywhere in country, the study has had to rely on the Association of Senior Staff of the Petroleum Industry of Nigeria (PENGASSAN) to generate a list of personnel who meet the above-stated requirements; about 130 people were identified clustered around Lagos and Port Harcourt, the latter being the southern part of Nigeria. Therefore the study population is the 130 individuals who meet the criteria outlined

above to qualify to be in the study. The study now moves to explain the sampling method used in this study.

### 5.3.1 Sampling method

The sampling method employed in determining the sample for the survey and interviews is purposive sampling. The use of purposive random sampling was employed because the participants have to meet certain requirements to qualify to participant in the study. About 130 members are identified as having financial risk management knowledge and experience and this is the basis of our study population.

To scientifically determine the survey sample size, the researcher employs the statistical computation of the sample size for finite population credited to Yaro Yamani (1964: 280) and also with web calculator at <http://www.calculator.net/sample-size-calculator.html> at 5% margin of error as stated in the following formula:

$$n = N / \{1 + N (e^2)\}$$

Where:

n = the desired sample size

N = the population

e<sup>2</sup> = acceptable margin error limit (0.05 on the basis of 95% confidence level)

$$\begin{aligned} \text{Therefore: } n &= 130 / (1 + 130(0.05^2)) \\ &= 130 / (1 + 130(0.0025)) \\ &= 130 / (1 + 0.325) \end{aligned}$$

$$= 130/1.325$$

$$= \text{approximately } 98$$

From the calculation, the sample size for this study for the administration of the questionnaire for this research was 98 respondents.

The study utilised the strategy recommended by Creswell and Plano-Clark (2011:195) in increasing rigour by selecting different participants for an inductive method and deductive method. While participants for the survey are drawn from top management to lower management, participants for interview are drawn from experts in the field of financial risk management in the industry. Moreover, it utilised a small number of interviewees to compliment the large sample of participants for the survey.

### **5.3.2 Data collection method**

The researcher collected data from primary and secondary sources for the proper execution of the study. Collection of evidence from existing literature is necessary for a study of this nature to demonstrate the present state of research in the financial risk management framework, and because this study is only relevant in relation to the secondary data according to Jankowicz (2000: 159) and Bryman (2012: 5). Keywords such as financial risk management, strategic risk management, critical success factors, challenges, risk factors, risk management framework and the Nigerian oil industry were utilised.

### 5.3.2.1 Secondary data collection

Secondary data sources have been the theoretical foundation on which this study is based. These sources include textbooks, journals, periodical, the internet, publicly available annual reports and theses. These sources expand the researcher's knowledge on the subject of risk management and in particular the strategic process of managing financial risks. They are also the sources of development of the instrument for this study. The Nelson Mandela University (NMU) library has been the main source of these secondary data utilised and supplemented by the University of KwaZulu-Natal library. The internet is another very useful source of already existing information, through university online library, google scholar, oil industry organisation's websites, the regulatory institution's websites and online periodical. Attention is now turned to primary data development and utilisation.

### 5.3.3 Research design

As mentioned in section 5.1 above, the present study employs a mixed method research design. Surveys can be both quantitative and qualitative research designs. When a researcher uses close-ended questionnaires, such a study will be located in a quantitative methodological paradigm, but when the researcher uses face-to-face or telephonic interviews, such a study will be located in the qualitative methodological paradigm.

### 5.3.3.1 Survey using questionnaires

Mail surveys are mostly conducted through the use of questionnaires. The questionnaire is said to be one of the most widely employed methods of generating primary data in social science (Babbie & Mouton, 2015; Collis & Hussey, 2014). There are two types of questionnaires: closed and open-ended questionnaires. Closed questionnaires, which allow for the ticking-off of well-defined response categories, are used in quantitative research, while open-ended questionnaires, which allow open spaces for respondents to write down their responses in words and sentences, are used in qualitative research. In the present study, a closed questionnaire was used.

The questionnaire used in this study was divided into three sections. In the first section, respondents were asked to complete personal demographic information about themselves. The second section, labelled Section A and comprising questions 1 to 6, consisted of questions relating to financial risks facing the industry and their impact on performance indicators of companies. Section A, also included questions concerning challenges in the management of these risks. The third section, labelled Section B and comprising questions 7 to 16, covered issues relating to FRM processes and the critical success factors of the strategic FRM process.

This study employed the self-administered questionnaire delivered by hand and by email to those who requested email. The questionnaire captured the respondents' perceptions about specific issues with regard to the Nigerian petroleum industry.

The questionnaire was prefaced with a covering letter (see Annexure 1) which explained why the study was being conducted, the sector of the economy on which the study focused, and how the confidentiality and anonymity of the participants were being protected. The participants were given specific instructions on how to answer the questions and were thanked for participating. The questions were ordered according to the objectives of the research. They were simply and clearly worded to make for easy understanding, and were not too long in order to encourage participation.

The development of the instrument involved the researcher formulating questions with a number of modifications and deliberations between the researcher and the supervisors of the study, as well as input from four expert practitioners from the Nigerian petroleum industry. The diction employed was simple and not too technical in order to boost an increased response rate. The questionnaire was planned in such a way that it could be completed in approximately 10 minutes. It was felt that a short and precise questionnaire would encourage a better response than a longer questionnaire would.

The dependent variable and the independent variables were generated through an extensive literature review. Sufficient information was extracted to describe the desired area of interest, to develop the conceptual framework for the study and to construct the independent and dependent variables investigated in the study. Special care was taken to ensure that questions or options were not double barreled. The vocabulary used was simple and ambiguity was guarded against. The questionnaire

statements were anchored to a selection from the following measuring scales (Likert scale) depending on the formulation of the particular statement:

- Yes [1] and No [2]
- Very low [1], low [2], average [3], high [4] and very high [5]
- Strongly disagree [1], disagree [2], neutral [3], agree [4] and strongly agree [5]
- Very unimportant [1], unimportant [2], neutral [3], important [4] and very important [5]

The content of questionnaire statements related to the following research questions:

- 1 What are the financial risks and impact of financial risks in the petroleum industry of Nigeria?

In order to manage financial risks effectively, it is necessary to know the kind of risks facing organisations, as one can only manage risks that one is aware of. Secondly, the strategy of management depends on the severity of the impact and the policy that is in place. Therefore, questions 1–4 were designed to determine the kind of financial risks facing the industry and the impact that these risks have on the operation of the companies in the industry.

- 2 What are the challenges and critical success factors in FRM systems in operation in the industry?



To determine the challenges faced by the industry in managing financial risks and the factors that will enable sustainability in the management of these risks, questions 5–15 were devoted to the challenges and critical success factors of an FRM system.

#### 5.3.3.1 What strategic FRM framework is suitable for oil companies in Nigeria?

Managing financial risk requires that one develops an effective framework that will guide the process. Questions 7–16 were utilised for the deployment of a framework that combines the critical success factors for a strategic FRM framework.

Mail surveys may be conducted by distributing questionnaires via e-mail, face-to-face, by post, or by using a combination of these methods. E-mail and post have been found to produce lower response rates; however, they are less expensive than face-to-face distribution. E-mail and face-to-face methods were therefore used in this study in order to encourage a higher response rate. Four fieldworkers (graduate students) helped with the face-to-face distribution of the questionnaires, with the researcher doing the same. E-mail was used to distribute questionnaires to participants who expressed that preference. A total of 98 questionnaires were distributed, and a response rate of 71% (N = 70) was achieved.

#### 5.3.3.2 Surveys through interviews

An interview is a two-way conversation in which the interviewer asks the participant questions to collect data and learn about the ideas, beliefs, views, opinions and

behaviours of the participant” (Nieuwenhuis in Maree, 2016: 92). The purpose of an interview is to obtain information from another person during a structured conversation, based on a set of prearranged questions (Babbie & Mouton, 2015).

There are three types of interviews (Nieuwenhuis in Maree, 2016):

- Open-ended or unstructured interviews. These interviews are usually conducted in ethnographic-type studies in which participants' ideas, beliefs, opinions and behaviours are investigated over a period of time.
- Semi-structured interviews. These interviews are used to corroborate data that emerged from other data sources. This type of interview is usually structured in advance and based on a specific line of inquiry.
- Structured interviews. In these type of interviews, “all participants receive the same set of questions, asked in the same order or sequence, by the same interviewer” (Nieuwenhuis in Maree, 2016: 93). This type of interview also allows very little flexibility in the way questions are asked and answered.

Semi-structured interviews were conducted in the present study because their purpose was to corroborate the data which was collected via the questionnaire and a specific line of inquiry was required. A highly structured interview was not preferred, as flexibility for further probing of questions was also required. The interview questions were designed in such a way that they were aligned with the questionnaire questions. They were 16 open-ended questions in total.

Interviewees were given the choice between a face-to-face and a telephonic interview. Each interviewee's right to drop out of the interview at any time was made clear to participants. The themes of the interview were supplied to the interviewees prior to the interview taking place. Participants were made aware of the fact that the interview would be recorded for transcription purpose before the commencement of the interview. Audio recordings of the interviews were made. It was explicitly communicated to interviewees that very sensitive and confidential information was not required in the interviews. The rights of interviewees (confidentiality, anonymity, voluntary participation and the right to withdraw at any time) were read to each participant before the commencement of the interview proper. The researcher read out each question and most of the time summarised what the interviewee was saying to make sure that it was, in fact, the interviewee's answer to the questions. The audio-recorded data was transcribed, and this formed the basis on which the qualitative results of the study were reported, analysed and interpreted.

#### **5.3.4 Validity and reliability of instruments:**

Validity and reliability are important in research for the outcome to be credible.

##### **5.3.4.1 Validity matters**

The two most important aspects of precision are reliability and validity. Internal validity guarantees that the study fruitfully measures what it sets out to measure or

accomplishes what it intends to attain. External validity guarantees that the study could be generalised to a wider population of the study (Sullivan, 2011: 119). The study applied simple face and content validity tests as well as other steps which are specifically outlined below.

- Triangulation procedure: In order not to depend on one data source, the study collected primary data from multiple sources to enhance validity. Yeasmin and Rahman (2012: 154) are of the view that mixed methods research is useful to overcome the defects of a single method and to confirm findings through a combination of diverse viewpoints. Hence, a semi-structured interview was employed in the study to corroborate the results of the questionnaire.
- The attitude of respondents: It is a commonly understood fact that when people know that they are being studied, they may offer unrealistic responses. To guard against this likelihood, the introductory note to respondents and interviewees requested them to be truthful if they decide to take part in the study; this was again highlighted before each interview. Interviewees were asked to choose the time and space in which the interview could take place to enable them to be as comfortable as possible.
- Instrumentation: This researcher certified that instruments used in the study were designed to accomplish what they set out to measure and that they were valid and reliable.
- Data source consistency: The researcher examined all data sources and settings to ensure that information generated by participants in this study originated from credible and reliable individuals, companies and institutions.

#### 5.3.4.2 Reliability issues

Mckinnon (1988: 36) describes reliability as the extent to which assessment results provided on one occasion could be repeated with the same results at a different time. The emphasis is on constancy in getting the same results if the measure is repeated (Heale & Twycross, 2015: 66). Thus, reliability is about the reproduction of research results with the same techniques and procedures. According to Mckinnon (1988: 36), the following questions arise for a research to be reliable:

- Is the methodology of the study and gauging tool consistent and accurate?  
To ensure that this study was reliable, the researcher employed the same theme for both interview and questionnaire survey. The questions were the same except for slight differences in wording, and while the questionnaire is closed-ended, interview question are open-ended.
- Will the same outcome ensue if the study is repeated?
- Can another researcher obtain the same outcome employing the same instrument?

There are several methods for determining reliability including stability (test-retest), equivalent (parallel forms) and internal consistency (split-half, KR20, Cronbach Alpha). The instrument for ascertaining reliability used by this study is Cronbach's alpha. The reliability scores for all sections exceeded the recommended Cronbach's alpha value of 0.600 for a newly developed construct. In many instances, the values were higher than the standard acceptable value (for a tested construct) of 0.700. This

indicates a degree of acceptable, consistent scoring for these sections of the research. However, three of the questions did have lower than acceptable scores for one of the following reasons:

- Misinterpretation of the questions by the respondents; and
- The subtle nature of the wording (impacting on direction).

Ethical consideration is said to arise in course of doing business research from seeking access to organisation or individual up to data report (Bryman, 2012: 129). In research, it is the responsibility of the researcher to find answers to the research questions responsibly following the conduct that is appropriately fit for academic behaviour (Wagner, Kawulick, & Garner, 2012: 62).

The researcher in this study did communicate the objectives of the research to respondents and interviewees as stated in the interview protocol and the introduction letter of the data collection instrument. Assurance of the confidential nature of the study was given to respondents before the commencement of interview and survey; pseudonyms were used to analyse interviewees' responses. In academic research, it is a necessity that researchers meet the university code of ethics before the pseudonyms were used to analyse interviewees' responses. In academic research, it is a necessity that researchers conform to the university code of ethics before the commencement of the research. Accordingly, this study obtained university approval for the methods of how the data was gathered, analysed, assessed and disseminated to the public. The next section details the data analysis strategy employed by the study.

## **5.4 DATA ANALYSIS**

Because this study was conducted using both the quantitative and qualitative methodological paradigms, the corresponding data analysis methods were required. The various quantitative and qualitative data analysis methods available are now briefly discussed.

### **5.4.1 Quantitative data analysis methods**

Data collected in a research study may be both qualitative and quantitative in nature. Quantitative data is generally analysed through the calculation of statistics, which include descriptive and inferential statistics. Descriptive statistics entail the calculation of means, medians, modes, standard deviations, sums, percentages and frequency distributions. These statistics are usually summarised in tables, charts and other graphical formats. Inferential statistics include the calculation of bivariate and multivariate statistics. A bivariate analysis involves an investigation of the relationship between two variables, while a multivariate analysis investigates the relationship between more than two variables. (Collis & Hussey, 2014: 12). Method of factor extraction and Varimax Raw rotation of the original factor matrix was used to validate the relation between critical factors and success of FRM and for the reduction.

Possible purposes of bivariate and multivariate analyses could be:

- to test for differences between independent and dependent samples (e.g. t-tests);
- to test for association between two nominal variables (e.g. Chi-square test);
- to test for association between two quantitative variables (e.g. Pearson's and Spearman's correlations, factor analysis and reliability tests); or
- to predict an outcome from one or more variables (e.g. linear and multiple regression analyses, time series analysis). (Collis & Hussey, 2014)

FRM success was measured in this study as the success that companies achieved in their methods of managing financial risk, in other words, how successful the companies were in (1) developing policy frameworks to manage financial risks, (2) identifying financial risks, (3) analysing FRM, (4) mitigating financial risks, and (5) communicating and controlling financial risks.

#### **5.4.2 Qualitative data analysis methods**

According to Babbie and Mouton (2016) and Collis and Hussey (2014), the following qualitative data analysis methods exist:

- Discourse analysis
- Content analysis
- Conversation analysis



- Hermeneutics
- Grounded theory
- Repertory grid
- Cognitive mapping

Each of these methods will be detailed below.

#### 5.4.2.1 Discourse analysis

Discourse analysis includes “a number of approaches to analysing the use of language in a social-psychological context” (Collis & Hussey, 2014: 169). Cunliffe (2008 in Collis & Hussey, 2014: 169) states that “discourse is viewed in various ways as talk, written text, social practice and/or physical and symbolic artefacts”. In analysing discourse, a researcher investigates how language both constructs and reflects reality (Collis & Hussey, 2014: 169). Through discourse analysis, the researcher explores “what is happening when people exchange information, make decisions and form relationships” (Johnston, 2002, in Collis & Hussey, 2014: 169).

Maree (2016) points out that, although there is no consensus on how to analyse discourses, a researcher conducting a discourse analysis will generally ask the following questions during the analysis of a way of talk, written text, social practice and artefact (whether physical or symbolic).

When analysing written text, the researcher could ask (Maree, 2016: 113):

- How is this text shaped by what it does in the world, what is about, and how is it related to the world of the audience?
- How is the text shaped by what human language is like in general, and by what the text originator's particular language is like?
- How is this text shaped by who the audience is, who the speaker is, what the relationship between speaker and audience is, who else is listening and how they are related to each other?
- How is this text shaped by what people expect to hear in this context, how they expect it to be said, what they expect it to be meant to mean?
- How is this text shaped by its medium? What sorts of differences can it make whether people are interacting face to face or at a spatial, temporal or social distance?
- How is the text shaped by purpose, intention, or by what speakers and audience are trying to accomplish?

#### 5.4.2.2 Content analysis

Content analysis is a research method which:

examines words or phrases within a wide range of texts, including books, book chapters, essays, interviews and speeches as well as informal conversations and headlines. By examining the presence or repetition of certain words and phrases in these texts, a researcher is able to make inferences about the philosophical assumptions of a writer, a written piece, the audience for which

a piece is written, and even the culture and time in which the text is embedded (Palmquist 1993 in Babbie & Mouton, 2015: 332).

Content analysis involves the systematic conversion of qualitative data into numerical data for further analysis (Collis & Hussey, 2014). Using content analysis, many words of the text are compressed into fewer content categories (Maree, 2016). Through this type of analysis, the researcher is able to report how many times a certain subject or object is observed or reported.

Palmquist (1993 in Babbie & Mouton, 2015: 492) suggests two types of content analysis, namely conceptual analysis and relational analysis. In conceptual analysis, the focus is on what the concept under investigation is, how it is identified/defined and how many times it occurs. Relationship analysis focuses on the relationship between the concepts rather than on the concepts themselves.

According to Palmquist (1993 in Babbie & Mouton, 2015: 492), the process to conduct conceptual content analysis involves the following steps:

- deciding on the level of analysis;
- deciding how many concepts to code for;
- deciding whether to code for the existence or frequency of a concept;
- deciding how to distinguish among concepts;
- developing rules for the coding of texts;
- deciding what to do with irrelevant information;

- coding texts; and
- analysing results.

The process of conducting a relational content analysis involves the following steps (Palmquist 1993 in Babbie & Mouton, 2015: 493):

- identify the question;
- choose the sample(s) for analysis;
- determine the types of analysis;
- reduce the text to categories and code for words of patterns;
- explore the strength, sign and direction of relationships;
- code the relationships;
- possibly perform statistical analysis; and
- map out the representations.

#### 5.4.2.3 Conversation analysis

Conversation analysis “is the study of talk in interaction and generally attempts to describe the orderliness, structure and sequential patterns of interaction, whether this is institutional (in an organisation), or casual conversation” (Nieuwenhuis in Maree, 2016: 112). This type of analysis entails the following steps:

- making audio recordings of different types of conversation (such as formal and informal speeches);

- transcribing these conversations;
- detailed inspection of audio recordings and the transcripts of such recordings;  
and
- analysing the patterns, structures and language used in the speeches and written words.

Conversation analysis has the following dimensions in common with other discourse analyses (quoted from Maree, 2016: 112) with [emphasis mine]:

- an interest in the properties of '**naturally occurring**' **language used** by the real language users (instead of a study of abstract language systems and invented examples);
- a focus on **larger units than isolated words and sentences** and, hence, new basic units of analysis: texts, discourses, conversations, speech acts, or communicative events;
- the extension of linguistics **beyond sentence grammar** towards a study of action and interaction;
- the extension to **non-verbal (semiotic, multimodal, visual) aspects** of interaction and communication: gestures, images, film, the internet and multimedia;
- a focus on dynamic (socio-)cognitive or interactional moves and strategies;
- the study of the functions of (social, cultural, situative and cognitive) **contexts of language use**; and

- an analysis of a vast number of **phenomena of texts, grammar and language use** (e.g. coherence, topics, macrostructures, speech acts, interactions, turn-taking, signs, politeness, argumentation, rhetoric, and many other aspects of text and discourse).

#### 5.4.2.4 Hermeneutics

Hermeneutics “is the science of text interpretation” (Babbie & Mouton, 2015: 31). Hermeneutics aims to systematically gain a “subjective understanding or interpretation of human action” (Babbie & Mouton, 2015: 30). In other words, through hermeneutics, researchers try to “interpret the ideas, purposes, and other mental states expressed in the world of human action” (Babbie & Mouton, 2015: 31).

Collis and Hussey (2014: 64) suggest that through hermeneutics, researchers try to interpret and understand text "in the context of the underlying historical and social forces". Hermeneutics originated from the way in which religion practitioners and scholars interpreted ancient scriptures, but the approach has been broadened to other areas such as law and business. This method of analysis can be applied to any situation where the historical meaning or context of the historic or contemporary text is investigated.

A hermeneutic circle is followed in this type of analysis. Gadamer (1976 in Maree, 2016: 111) calls it a constant movement “from the whole to part and back to the whole”. Through this circular movement, the researcher tries to decipher “the hidden meaning

in the apparent meaning” and “searching for and unfolding the levels of meaning implied in the literal meaning of the text” (Gadamer 1976 in Maree, 2016: 111). The hermeneutic circle is important because “the meaning of any part of the text cannot be understood without reference to other parts, the complete text and the historical and social context” (Taylor 1990 in Collis & Hussey, 2014: 65).

#### 5.4.2.5 Grounded theory

Collis and Hussey (2014: 70) define grounded theory as "a framework in which there is a joint collection, coding and analysis of data using a systematic set of procedures to develop an inductively derived theory". There are two methodological approaches to grounded theory (see Maree, 2016: 79): systematic procedures approach espoused by Strauss and Corbin in 1998 and constructivist grounded theory popularised by Charmas in 2006.

In the systematic procedures approach, the researcher develops a theory from the data that explains process, action, or interaction on a phenomenon. The constructivist grounded theory approach entails “flexible guidelines, a focus on theory development that depends on the researcher’s view, learning about the experience within embedded, hidden networks, situations, and relationships, and making visible hierarchies of power, communication, and opportunity” (Nieuwenhuis in Maree, 2016: 80).

According to Silverman (2013, in Collis & Hussey, 2014; 70), grounded theory includes the following key stages:

- an attempt to develop initial categories that illuminate the data;
- the use of theoretical sampling to confirm these initial theoretical categories by including many different social settings in an attempt to “saturate” the categories with many appropriate cases in order to demonstrate the importance of the categories; and
- constant comparison as new data is used to modify the categories and develop them into a general analytic framework with relevance outside the research setting.

Strauss and Corbin (1998 in Babbie & Mouton, 2015) emphasise that in grounded theory, the researcher does not begin with a theory and then prove it. The researcher instead begins with an area of study and then allows whatever is relevant to that area to emerge.

#### 5.4.2.6 Repertory grid

The repertory grid method "is a form of the structured interview during which a matrix (the grid) that contains a mathematical representation of the perceptions and constructs a person uses to understand and manage his or her world is developed" (Collis and Hussey, 2014: 185). This technique requires the researcher to identify elements and constructs and a procedure that enables participants to relate the constructs to the elements. The elements (the objects or concepts under



investigation) are usually the headings of the columns of the grid, while the constructs (the characteristics or attributes of the elements) are the headings of the rows of the grid.

Collis and Hussey (2014: 186) propose the following procedure to use a repertory grid:

- determine the focus of the grid;
- determine the elements in advance or agree on them with each interviewee (approximately 5–10 elements);
- write each element on a separate card;
- describe whether to use triads or dyads;
- select the appropriate number of cards at random;
- ask the interviewee to provide a word or phrase that describes each similarity and difference between the pairs of elements;
- use these words or phrases as the constructs on the grid;
- explain the rating scale to the interviewee (for example 5=high, 1=low);
- ask the interviewee to indicate the number closest to his or her view and explain the reason; and
- construct a grid for each interviewee based on his or her responses and scores.

#### 5.4.2.7 Cognitive mapping

According to Collis and Hussey (2014: 188) cognitive mapping "is a method based on personal construct theory that structures a participant's perceptions in the form of a

diagram". This method is widely used in business research to analyse and structure the decision-making processes people follow to solve problems. Cognitive mapping "can be used to summarise interview transcripts or documentary data in a way that promotes reflection and analysis of the problem, leading to potential solutions" (Collis & Hussey, 2014: 188).

The following stages are followed in cognitive mapping:

- An account of the problem is broken into phrases of about ten words which retain the language of the person providing the account. These are treated as distinct concepts which are then reconnected to represent the account in a graphical format. This reveals the pattern of reasoning about a problem in a way that linear text cannot.
- Pairs of phrases can be united in a single concept where one provides a meaningful contrast to the other.
- The distinct phrases are linked to form a hierarchy of means and ends, essentially explanations leading to consequences (Collis & Hussey, 2014: 188).

#### 5.4.2.8 The data analysis methods used in the present study

As reported above, both quantitative and qualitative data analysis methods were used in the present study. The quantitative data analyses includes the following:

- the calculation of Cronbach alphas to ascertain the internal consistency reliability of the data;
- exploratory factor analyses to evaluate the construct (more particularly, the discriminant) validity of the data;
- descriptive statistics to investigate the perceptions of respondents on various aspects pertaining to the issue at hand, namely FRM;
- two-sample t-tests to investigate whether upstream and downstream sectors of the petroleum industry differed significantly with regard to the various aspects of FRM;
- multiple regression analyses to investigate which latent variables were the most important factors influencing FRM success; and
- Pearson correlations to investigate other factors that might influence FRM success.

Secondly, semi-structured interviews were conducted with selected expert practitioners in the field. Documentary evidence from the various organisation websites and industry reports in the public domain was also collected. The content analysis method was employed to analyse these data sets.

## **5.5 CHAPTER SUMMARY**

This chapter presented a comprehensive explanation of the research design of this study. It focused on the theoretical purpose and rationale of the methodology chosen, ethical considerations, data-gathering techniques and an explanation of the data

analysis method used. The next chapter presents the findings of this study as a result of data analysis. It discusses the data obtained and interprets the findings in relation to the research aim of this study.

## CHAPTER 6

### THE EMPIRICAL RESULTS

#### 6.1 INTRODUCTION

In this chapter, the empirical results of the study are reported and interpreted. The study investigated the following research questions:

- 1) What are the financial risk factors in the petroleum industry of Nigeria?
- 2) What is the impact of financial risks on petroleum companies in Nigeria?
- 3) What are the challenges in FRM that petroleum companies encounter in Nigeria?
- 4) What are the critical success factors for a strategic FRM in the petroleum industry in Nigeria?
- 5) Do upstream and downstream companies differ with regard to their evaluation of FRM issues in the petroleum industry in Nigeria?
- 6) What would be an effective strategic FRM framework for petroleum companies in Nigeria?

The demographic composition of the sample will now be discussed. Thereafter, the empirical results related to each of these research questions will be presented and discussed in detail.

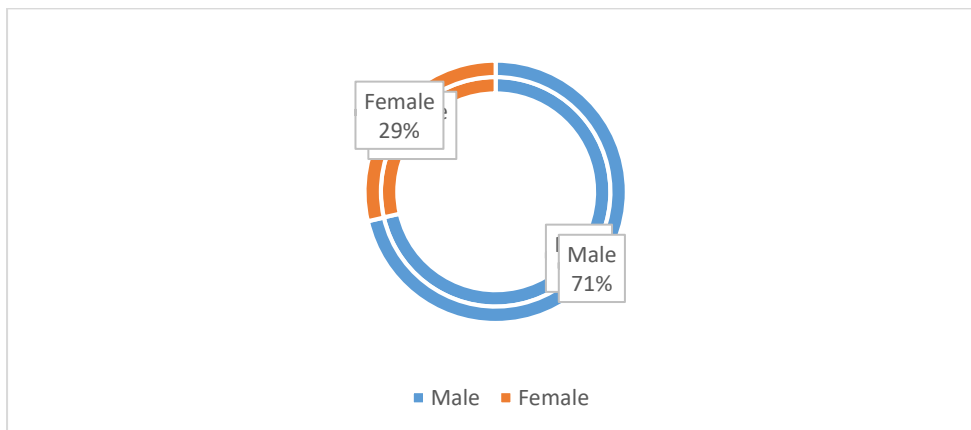
## 6.2 DEMOGRAPHIC COMPOSITION OF THE SAMPLE

This section reports on the following demographic characteristics of the sample: Sex, age, occupation, management position, and the sector of the petroleum industry with which the respondent is associated.

### 6.2.1 Sex distribution

Figure 6.1 and Table 6.1 show that of the 70 respondents taking part in the study, 50 (71.4%) were males and 20 (28.6%) were females. This is a true reflection of the sex distribution in the Nigerian petroleum industry. More of the risk management practitioners are male than female in this industry.

**FIGURE 6.1: SEX DISTRIBUTION OF THE SAMPLE**



**TABLE 6.1: SEX DISTRIBUTION OF THE SAMPLE**

	<b>Variable description</b>	<b>Frequency</b>	<b>Percentage</b>
	Male	50	71.4
	Female	20	28.6
	Total	70	100.0

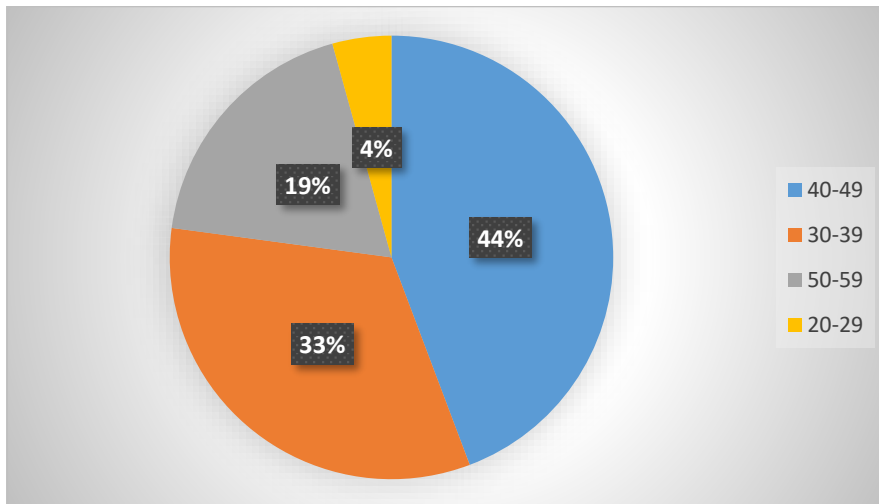
### 6.2.2 Age distribution

Table 6.2 and Figure 6.2 indicate that most of the respondents (n=31, 44%) fall into the 40–49 age bracket. Those between the ages of 30 and 39 account for 33% (n=23) of the sample, while those within the 50–59 bracket account for 19% (n=13) of the sample, and those between 20 and 29 years account for 4% (n=3) of the sample. This means that those who manage financial risks in the Nigerian petroleum industry are more likely to be between 30 and 49 years old.

**TABLE 6.2: AGE DISTRIBUTION OF THE SAMPLE**

	<b>Variable description</b>	<b>Frequency</b>	<b>Percentage</b>
	40-49	31	44
	30-39	23	33
	50-59	13	19
	20-29	3	4
	Total	70	100.0

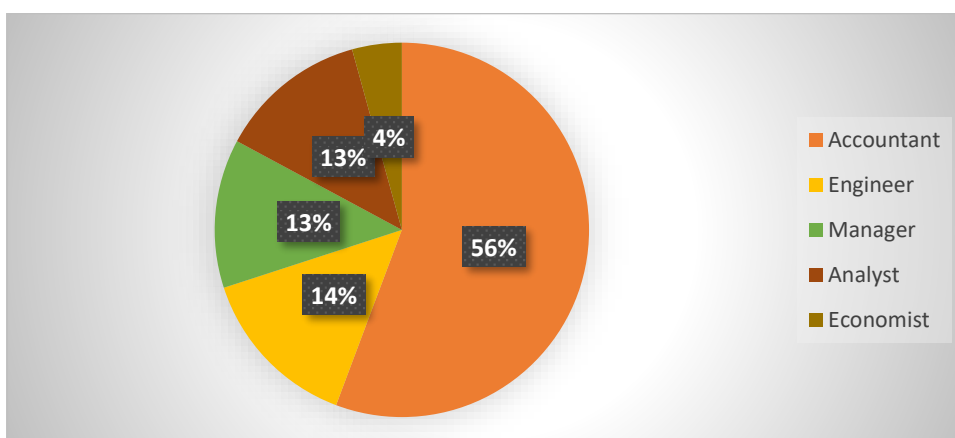
**FIGURE 6.2: AGE DISTRIBUTION OF THE SAMPLE**



### 6.2.3 Occupational distribution

As illustrated in Figure 6.3 and Table 6.3 below, the occupational distribution of the respondents was as follows: 56% were accountants (n=39), 14% were engineers (n=10), 13% were managers (n=9), 13% were analysts (n=9) and 4% were economists (n=3). It would, therefore, appear that those who manage financial risks in the Nigerian petroleum industry are more likely to come from the accounting profession.

**FIGURE 6.3: OCCUPATION DISTRIBUTION OF THE SAMPLE**





**TABLE 6.3: OCCUPATION DISTRIBUTION OF THE SAMPLE**

Variable description	Frequency	Percentage
Accountant	39	56
Engineer	10	14
Manager	9	13
Analyst	9	13
Economist	3	4
<b>Total</b>	<b>70</b>	<b>100.0</b>

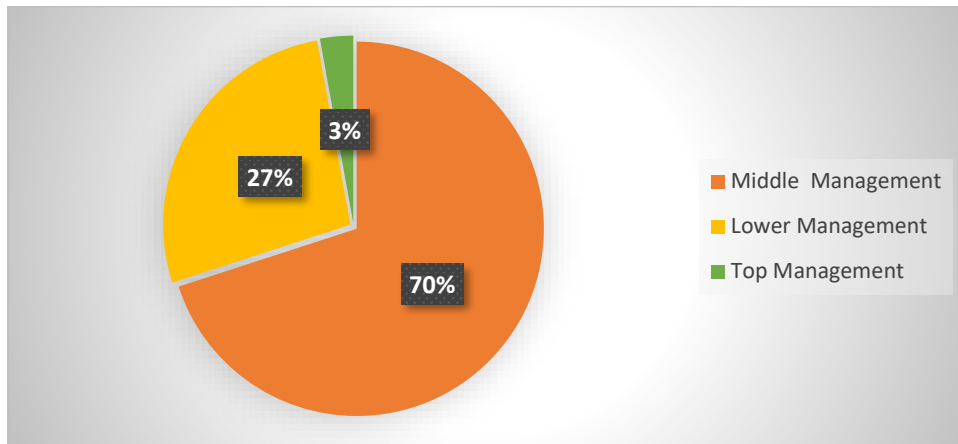
#### 6.2.4 Managerial level

Table 6.4 and Figure 6.4 show that middle managers accounted for 70% (n=49) of the sample and lower-level managers 27% (n=19). Top managers accounted for only 3% (n=2) of the sample. It appears that top managers are delegating the function of FRM largely to middle management in the Nigerian petroleum industry. Therefore, it might be said that middle management is more likely to manage financial risks in the Nigerian petroleum industry than top management or lower level management. This proposition was confirmed by an interviewee, Mr A, who stated: "*Top management only reviews the policies on risk management; it is the risk management department that formulates risk management policies but top management reviews the policies.*"

**TABLE 6.4: MANAGERIAL LEVEL OF DISTRIBUTION OF THE SAMPLE**

Variable description	Frequency	Percentage
Middle management	49	70
Lower management	19	27
Top management	2	3
<b>Total</b>	<b>70</b>	<b>100.0</b>

**FIGURE 6.4: MANAGERIAL LEVEL OF DISTRIBUTION OF THE SAMPLE**



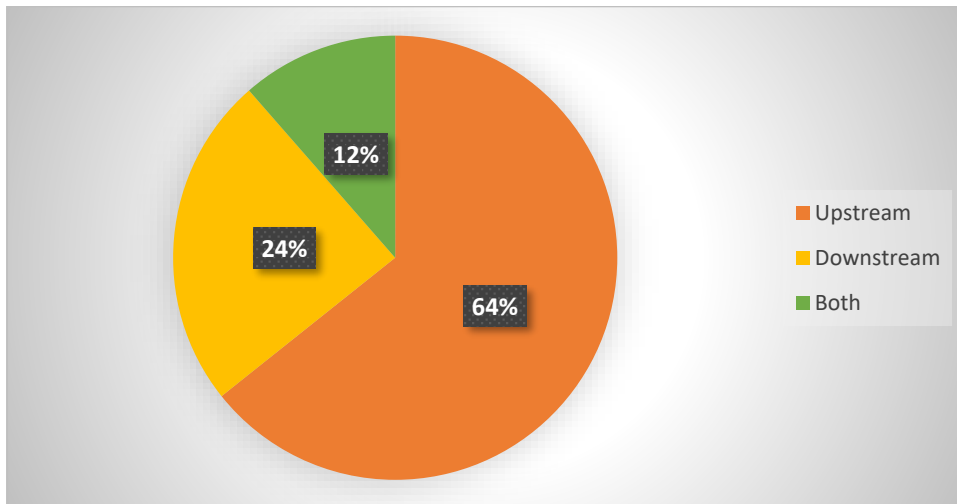
### 6.2.5 Petroleum sector

As shown in Table 6.5 and Figure 6.5, the majority, 64% (n=45), of the respondents were from the upstream sector and 24% (n=17) were from the downstream sector of the Nigerian petroleum industry. Those whose companies are involved in both upstream and downstream accounted for 12% (n=8). This analysis, therefore, means that more of the respondents come from the upstream sector of the Nigerian petroleum industry.

**TABLE 6.5: SECTOR DISTRIBUTION OF THE SAMPLE**

Variable description	Frequency	Percentage
Upstream	45	64
Downstream	17	24
Both	8	12
Total	70	100.0

**FIGURE 6.5: SECTOR DISTRIBUTION OF THE SAMPLE**



### **6.3 EMPIRICAL RESULTS FROM THE RESEARCH QUESTIONS**

#### **6.3.1 The nature of financial risks in the Nigerian petroleum industry**

The first research question was as follows:

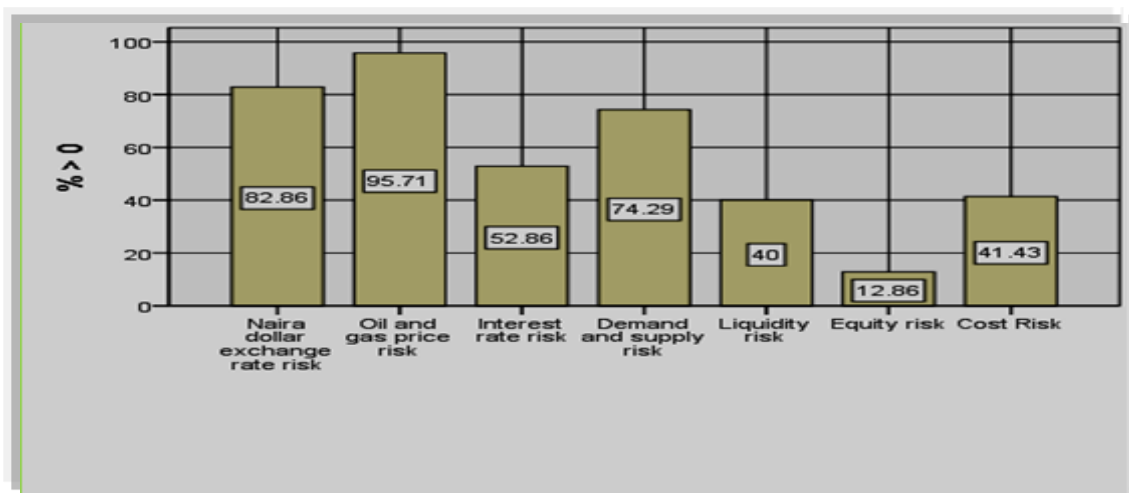
- ***What is the nature of financial risks in the petroleum industry of Nigeria?***

The empirical results to the research question are summarised in Table 6.6 and Figure 6.6. These results emanate from descriptive statistics and are triangulated with quotes from the interviews organised with five selected FRM experts in the industry (IA, IB, IC, ID and IE).

**TABLE 6.6: NATURE OF FINANCIAL RISKS IN THE PETROLEUM INDUSTRY – THE EMPIRICAL RESULTS**

Rank	Type of risk	Frequency	Percentage
	Commodity (oil and gas) price risk	67	95.7
	Naira/dollar exchange rate risk	58	82.9
	Demand and supply risk	52	74.3
	Interest rate risk	37	52.9
	Cost of doing business risk	29	41.4
	Liquidity risk	28	40.0
	Equity risk	9	12.9

**FIGURE 6.6: NATURE OF FINANCIAL RISKS IN THE PETROLEUM INDUSTRY – THE EMPIRICAL RESULTS**



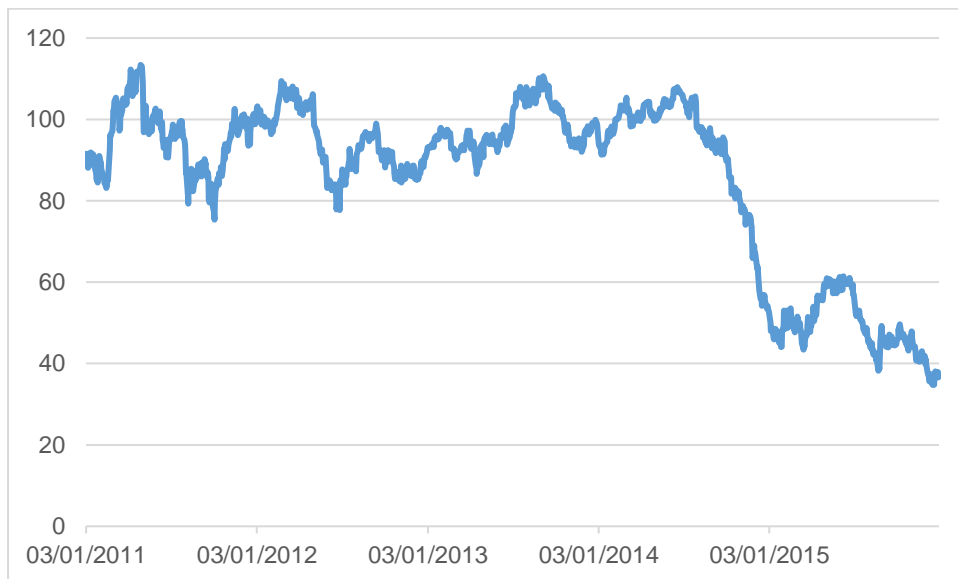
### 6.3.1.1 Commodity (oil and gas) price risk

Table 6.6 and Figure 6.6 reveal that the majority, 96% (n=67), of the respondents believed that fluctuations in commodity prices (prices of oil and gas products) were the most important financial risk in the Nigerian petroleum industry. Only 4% (n=3) of the respondents did not think that price fluctuation was affecting the industry negatively.

This empirical result supports Eni's (2013:174) assertion that unstable oil prices played an important part in realising the organisation's operating objectives or not. Figure 6.9 in section 6.3.2.1, shows how badly the price of oil has deteriorated from US\$125 in 2011 to US\$30 in 2015, indicating that now is a better time to manage financial risk strategically as these risks are interconnected as shown in section 3.3.

The empirical result was also supported by the opinions expressed by the interviewees. For instance, Mr C of a downstream organisation remarked, "*Naira dollar fluctuation, interest rate fluctuation – but the major one is the price of oil and gas.*" Equally, Mrs E, who is a financial risk manager of an upstream organisation, said: "*Price of oil is fixed or determined internationally.*" She was referring to the fact that petroleum industry companies in Nigeria were price-takers (oil companies do not decide the prices of their products) and their prices were determined by world economic factors. It could therefore be concluded from the preceding empirical results that fluctuations in commodity prices were a key financial risk that should be considered in the petroleum industry. For example. Eni's (2013) integrated annual report stated that prolonged low oil prices create uncertainty in achieving their objectives of production growth and replacement of reserve more especially as their operation is based on JVCs.

**FIGURE 6.7: CRUDE OIL PRICE 2011 TO 2015**



Source: InfoMine.com

In Figure 6.7, it can be seen that the commodity price has hit an all-time low, dropping from a height of US\$113 in 2011 to US\$34 in 2015, creating untold hardship for financial risk managers in the Nigerian petroleum industry. The drop in the price of oil means that there is a decrease in revenue, profitability, and cash flow for organisations in the petroleum industry of Nigeria, which may result in even more credit risk and a higher interest rate payment.

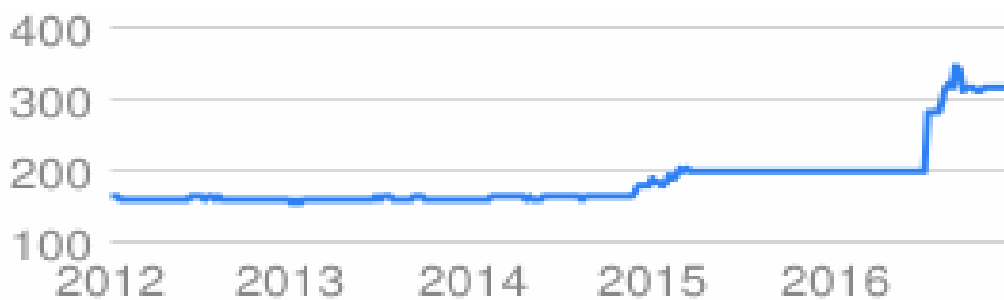
#### 6.3.1.2 Exchange rate risk

Table 6.6 and Figure 6.6 show that 83% (n=58) of the 70 respondents agreed that the exchange rate of the Naira against the US dollar negatively affected their operations in the Nigerian petroleum sector and this was ranked the second most important financial risk in the petroleum industry. The remaining 17% (n=12) of the respondents

disagreed that exchange rates fluctuations negatively impacted on their operations in the Nigerian petroleum industry.

The interviewees had the following to say on this issue: MR A of a downstream organisation, remarked: *“The fluctuation of the Naira exchange rate before now was affecting oil industry although that effect was being cushioned by the subsidy fund being paid by the government ... Naira dollar fluctuation, interest rate fluctuation, but the major one is the price of oil and gas.”* Mr D, a financial risk manager whose organisation operates in both the downstream and upstream sectors of the Nigerian petroleum industry, remarked, *“What we get from sales is always dictated by the exchange rate of the Naira.”* An example of exchange rate fluctuation losses in the industry is that of Forte Oil Plc foreign exchange translation losses, reported in the annual report of 2014 as N77 million and in the report of 2015 as N106 million.

**FIGURE 6.8: NAIRA DOLLAR EXCHANGE RATES**



Source: Bloomberg 2016

The trend of the Naira against other major currencies is on the decline from N163 to US\$1 in June 2012 to the current price of over N316 in October 2016 as shown in

Figure 6.8. These financial risks mentioned in Table 6.6 according to the Pearson correlations indicates that these risk factors not only affect the organisations in the industry negatively, but also affect one another. For example, the exchange rate has a significant effect on demand and supply risk ( $r=0.43$ ,  $p < 0.05$ ), cost risk ( $r=0.31$ ,  $p < 0.05$ ), interest rate risk ( $r=0.32$ ,  $p < 0.05$ ), and liquidity risk ( $r=0.29$ ,  $p < 0.05$ ). This finding confirmed the interconnection of these financial risk factors and shown in section 3.3.

The abovementioned results show that exchange rate fluctuation is a risk factor whose effect is felt by most of the industry operators. In the context of the present study, this is the second most important financial risk in the Nigerian petroleum industry.

#### 6.3.1.3 Demand and supply risk

According to Table 6.6 and Figure 6.6, 74% ( $n=52$ ) of respondents agreed that demand/supply risk was a risk factor that negatively affected the operations of companies in the Nigerian petroleum industry. The remaining 26% ( $n=18$ ) of the respondents disagreed that demand and supply risk negatively affected their operations. According to respondents' responses, this risk was the third most important financial risk in the petroleum industry.

Providing more clarity on what the risk was, the interviewees revealed the following: Mr D, of both an upstream and downstream organisation, revealed that there was actually an over-supply of oil in the export market in Nigeria. He stated, "*The fact that*



*we have um ... ships that are floating all over the water looking for buyers meaning there is too much supply or a demand problem because there, is a glut, oil glut.”* The discovery of oil in North America means that America, which is one of Nigeria’s largest importer of oil and gas, has drastically reduced its importation from the country (CBN. 2013). This was confirmed by Mr B’s statement, *“The other big risk relates to that of the demand and supply of the products.”*

#### 6.3.1.4 Interest rate risk

As illustrated in Table 6.6 and Figure 6.6, 53% (n=37) of the respondents agreed that interest rate increases (referring to interest paid for borrowed funds) impacts negatively on the petroleum sector of Nigeria operations. However, 47% (n=33) of the respondents disagreed that the interest rate was negatively affecting the industry. According to respondents’ responses, this was the fourth most important financial risk in the petroleum industry.

Interviewees reported that interest rates were a bigger problem for local oil companies than for international ones as local interest rates were much higher than developed nations’ interest rates. Mr D, for example, stated that companies in the industry have no choice other than to borrow from the banks or venture capitalists and they were not generating enough equity funding. He stated, *“We do not talk about interest rates in Nigeria because the companies do not have a choice.”* On the other hand, Mr C, whose organisation operates in the upstream sector as an international oil organisation, remarked, *“Interest rate does not affect us so much because we do not*

*source fund locally.*” Interest expenses reported by Oando in 2013 were N21.6 billion and in 2014 were N38.7 billion; the weighted cost of borrowing was 13% for 2014.

#### 6.3.1.5 Cost of doing business risk

The cost of doing business in the petroleum industry in Nigeria is ranked the fifth most important financial risk in that industry. Table 6.6 and Figure 6.6 show that 41% (n=29) of the respondents agreed that the cost of doing business was a risk factor that negatively impacted on the petroleum industry of Nigeria. This was as a result of the depreciation of the Naira, since most equipment in the industry was imported. The remaining 59% (n=41) of the respondents disagreed that the cost of doing business was a financial risk factor that could negatively impact on the petroleum industry of Nigeria. In the context of the present study, this is the fifth most important financial risk in the Nigerian petroleum industry.

The interviewees support the abovementioned assertion. Mr D, for example, said, *“Companies are calling for redundancy of staff because the cost of doing business has become so high.”* Mrs E remarked, *“Cost of doing business, especially when it relates to the demand of host communities, is very high. Through destruction and vandalising infrastructure and oil theft; things like these increase the cost of doing business.”*

Host communities’ beneficiation is a risk that is very specific to the Nigerian petroleum industry operations, as there is no up-to-date regulation in Nigeria that stipulates how host communities should benefit from the oil and gas produced from their land. This

factor is driving up costs, and sometimes these oil wells are shut by these communities. In this regard, Mr D commented, "*The international oil companies are shifting emphasis from the marginal field to offshore deep water. It simply means that if you look at the risk that they take with all these community crises, pipeline vandalising, um ... sometimes it get so nasty that the community will take over the plants.*" The interviews strongly support cost of doing business as a financial risk; however, the quantitative data analyses support the opposite view point.

#### 6.3.1.6 Liquidity risks

The sixth important financial risk for the Nigerian petroleum industry is liquidity risk. Table 6.6 and Figure 6.6 indicate that only 40% (n=28) of respondents agreed that liquidity risk (which is the risk of not having the funds to pay debts and services when due) was a risk factor that negatively affected the Nigerian petroleum industry. Most of the respondents, 60% (n=42), disagreed that liquidity risk was a risk factor that could negatively affect the Nigerian petroleum industry.

One interviewee supported the view that liquidity risk was a risk factor that negatively impacted the Nigerian petroleum industry, but also reported that banks were more inclined to provide loans to petroleum companies. Mr C, a financial risk manager of a downstream organisation, commented: "*Liquidity risks definitely affect the organisation's operations*", but he also noted that, "*in Nigeria, the financial institutions are ready to give a loan to oil sector companies more than any other sector.*"

Another interviewee observed that liquidity issues had forced them to delay payments to contractors, service providers and workers. Mrs E stated, "*The other area that it affect us is in terms of payment. When the cash flow is lower, contractors are not paid and even sometimes it forces us to delay payments of worker remuneration. Right now as I speak there are some workers that are due for payment of housing scheme that has not been paid due to cash flow.*" It can be seen that these interviews strongly support liquidity risk as a financial risk while the quantitative data analyses support the opposite point of view.

#### 6.3.1.7 Equity risk

The seventh important financial risk for the Nigerian petroleum industry is equity risk (which is the risk that the value of these companies' stock will go down and erode the value of these companies). In fact, most of the respondents do not believe that this is an important financial risk in the Nigerian petroleum industry.

Table 6.6 and Figure 6.6 reveal that only 13% (n=9) of the respondents in the study agreed that equity risk negatively affected the Nigerian petroleum industry. Most of the respondents (87%, n=61) disagreed that equity risk was a financial risk factor that negatively impacted on their ability to achieve their objectives in the Nigerian petroleum industry.

The interviewees indicated that equity risks emerged when the Nigerian government was unable to fund joint venture partnerships. Mr D said, "*Government is not able to*

*fulfil its financial obligation. Even the banks are denying the companies access to funding loans.”* Mr A, whose establishment is in the upstream sector, remarked, *“We are short of funds, especially as our main business is a joint venture operation and so the funding which is mainly the government is actually affecting the operation.”* Government inability to come up with its share of JVC’s funding in a time of prolonged low oil prices (as at April 2016) has put more pressure on JVC’s partners to seek alternative funding, as showing in section 2.2.7.

The general opinion of the respondents was that their operations in the Nigerian petroleum industry could be negatively affected by financial risks such as oil and gas price fluctuations, exchange rate volatilities, demand and supply risk and interest rate volatilities as these were mostly external risks and could not be easily controlled by management. Liquidity risk, the cost of doing business, and equity risk were not regarded by the majority of financial risk managers who took part in the study as financial risks that could negatively impact on their operations as these could somehow be controlled internally by management.

The overall implication is that these identified financial risk factors needed to be properly managed by the companies in the industry through the development of an integrated FRM system in order to meet their business objectives and create value for stakeholders. Moreover, during the identification of financial risks, it was very important to identify all financial risks facing these companies before analysis could determine the correct effect of each of these identified risks so as to avoid the “pit hole of the blind spot” in management which Stulz (2008:7) cautions risk managers about.

This also implies that oil companies in Nigeria now rely on loan funding instead of equity to carry out operations, which increases the cost of interest rates, confirming the literature review conclusions in section 2.2.1.3.

### **6.3.2 The impact of financial risks on the petroleum industry in Nigeria**

The research question in this regard is as follows:

- ***What is the impact of financial risks on the petroleum industry in Nigeria?***

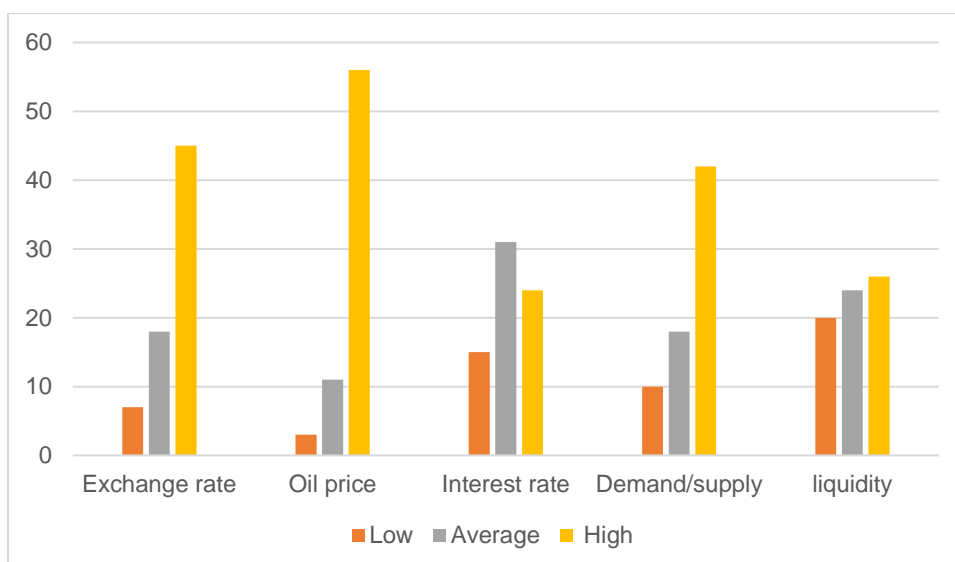
This section explores the respondents' assessment of the extent to which financial risks influenced the petroleum industry in Nigeria. The assessment does not, however, statistically measure the relationship between the financial risks and the FRM success. The empirical results are reported in Table 6.7 and Figure 6.9.

After the abovementioned assessment, Pearson's correlations were calculated between the financial risks and FRM success, in order to assess the statistical significance of these relationships. Discrepancies between the abovementioned assessments and the Pearson correlations were noted and discussed.

**TABLE 6.7: EFFECT OF FINANCIAL RISK FACTORS IN THE INDUSTRY**

Variable	Low	Average	High	Mean	Rank	SD.
Exchange rate	7	18	45	3.86	2	0.92
Oil price	3	11	56	4.24	1	1.03
Interest rate	15	31	24	3.16	4	1.09
Demand/supply	10	18	42	3.61	3	0.85
Liquidity	20	24	26	3.06	5	1.09
<b>Average</b>	<b>11</b>	<b>20.4</b>	<b>38.6</b>	<b>3.59</b>		<b>0.99</b>

**FIGURE 6.9: EFFECT OF FINANCIAL RISK FACTORS IN THE INDUSTRY**



### 6.3.2.1 Commodity prices effect on the industry

As illustrated in Table 6.7 and Figure 6.9, the majority (80%, n=56) of the respondents agreed that the negative effect of commodity price fluctuations on the oil and gas companies' operations in Nigeria was significant. One of the interviewees, Mr B of

both an upstream and downstream organisation, commented: *"Yeah, if we take each one of them at a time, the scariest one is price fluctuation because it is the commodity we need to plan on that because this is a big risk. It has been shown in the market, um ... within six months the price of commodity dropped from about 120 dollars to 50 dollars, and that is a big risk that most of us face in the oil industry."* Of all the financial risk factors, commodity prices had the most negative impact because that was where oil companies generated income for their operations. While 16% (n=11) of the respondents were of the opinion that the negative effect of commodity price fluctuation on their companies' operations was average, only 4% (n=3) of the respondents who took part in this study agreed that the negative effect of commodity price fluctuations on their companies operation was low.

The effect commodity prices achieved a high mean score (mean=4.24) which indicates that more respondents scored towards the high end of the Likert scale. The standard deviation (SD=1.03) was relatively small, indicating that there was not much deviation from the mean in the pattern of scoring. This implies that the industry risk managers have to devote time to the management and controlling of commodity price fluctuation risk if they want to survive, as its impact is significant.

#### 6.3.2.2 Exchange rate effect on the industry

Most respondents (64%, n=45) in the surveyed petroleum organisations agreed that the exchange rates of major foreign currencies (US dollar, euro, and the British pound) to the Naira had serious negative impacts on operations in their companies as shown



in Table 6.7 and Figure 6.9. This view was also shared by most of the interviewees. For example, Mrs E of an upstream organisation remarked, "*It is mostly adverse effect and is very high, exchange rates fluctuation on oil prices or commodity, the effect is very high, very high.*" According to another 26% (n=18) of the respondents, the foreign exchange rates of the Naira against major currencies had average negative effects on their companies. According to Mr A of an upstream organisation, "*exchange fluctuation is actually a little bit but not so much on the industry*". In the opinion of only 10% (n=7) of the respondents, the negative effect of exchange fluctuation on their companies was low. For instance, Mr C, a financial risk manager of a downstream oil organisation, said: "*The fluctuation of the Naira exchange rate before now was affecting oil industry, although that effect was being cushioned by the subsidy fund being paid by the government.*"

This result achieved a high mean score (mean=3.86) which indicated that more respondents scored towards the high end of the Likert scale. The standard deviation (SD=0.92) was relatively small, indicating that there was not much deviation from the mean in the pattern of scoring. The inference is that the negative effect of exchange rates fluctuation on oil companies' operations was considerable, and sometimes destroyed their ability to accomplish their objectives.

The interviewees voiced the same opinion as expressed by the survey respondents. They understood that most of the costs were denominated in foreign currencies, so that any slight exchange rate fluctuation could affect them heavily, not only for exported products but also with the importing of production equipment. Mr C, for

example, commented: "*The local cost has been well managed with the structure that we have but where we have bigger issues are the ones related to foreign cost in terms of getting capital and equipment.*" And Mrs E stated, "*It is mostly adverse effect and is very high, exchange rates fluctuation and oil prices or commodity, the effect is very high, very high.*"

The organisation, Total Nigeria PLC, for instance, reported a foreign exchange net loss of N203m in 2015 and N124.8m in 2014 as a result of the negative effects of the exchange rate.

#### 6.3.2.3 Demand and supply effect on the industry

The majority (60%, n=42) of respondents agreed that the falling demand and oversupply of oil and gas products had a profound negative effect on the companies operating in the petroleum industry of Nigeria, as illustrated in Table 6.7 and Figure 6.9. The survey response regarding oversupply and under-demand was confirmed by one of our interviewees, Mr D, who stated, "*The fact that we have um ... ships that are floating all over the waters looking for buyers meaning there is too much supply or a demand problem because there, is a glut, oil glut.*" However, 26% (n=18) of the respondents who took part in the study believed that the negative effect on the operations of companies due to low demand and the oversupply of petroleum products in the industry was average. It emerged from the interviews that this view was a result of the huge local market for petroleum products such that local sellers, especially the marketers, had no sluggish days. One of the interviewees, Mr C of a downstream

organisation, explained that they had the opposite situation of undersupply and over-demand of petroleum products when he stated: *“The market for oil in Nigeria is very huge so there is no amount of products that you have in stock, it does not take too much time to sell them.”* Fourteen per cent (n=10) of the respondents agreed that the negative effect of demand and supply risk on achieving their objectives in the industry was low.

The effect of demand and supply risk achieved a high mean score (mean=3.61), which indicated that more respondents scored towards the high end of the Likert scale. The standard deviation (SD=0.845) was relatively small, indicating that there was not much deviation from the mean in the methods of scoring. This signifies that the industry was indeed suffering from the negative impact of under-demand and oversupply risks.

#### 6.3.2.4 Interest rates effect on the industry

As shown in Table 6.7 and Figure 6.9, most of the respondents (44%, n=31) agreed that interest rates fluctuations have an average negative effect on companies' ability to achieve their strategic objectives in the Nigerian petroleum industry. Nevertheless, 34% (n=24) of respondents agreed that interest rate fluctuations have a high negative effect on the Nigerian oil and gas industry and could lead to a situation of not achieving their strategic objectives. Mr. C, of a downstream organisation, remarked, *“Fluctuation in the prices of oil and gas is very low, but interest rate fluctuation is very high.”* As the price of gas and oil for downstream companies is fixed by the government, there is not

much fluctuation, but the interest rate, which is the rate at which banks lend to them, fluctuated badly and is affecting their ability to achieve their objectives.

Twenty-two per cent (n=15) of respondents agreed that interest rate volatility had a low negative effect on the ability of companies in the Nigerian petroleum industry to achieve their strategic objectives. This view was supported by one of the interviewees, Mr A of an upstream oil organisation, when he remarked, *"Interest rate does not affect us so much, and the reason is that international oil organisation is not sourcing for funding in the local market."* This view resulted from the fact that the interest rate is very low in some advanced economies.

Although interest rate volatility since the financial crisis has subsided, the cost of finance for some local oil and gas companies in 2013 was in the billions, as reported in their annual financial reports. For example, Forte Oil PLC spent N1.8 billion, Oando PLC spent N21.6 billion, and Conoil PLC spent N1.6 billion on interest rates in the year 2013. This signifies that interest rate volatility has negatively affected the operations of local Nigerian petroleum companies in the industry, although this could not be said of international oil companies as they sourced funds centrally through their parent companies, as Mr A described. Furthermore, an analysis of publicly available information from companies' annual reports showed that on average, the weighted cost of borrowing for a local oil organisation like Oando was 13% for 2014, while an upstream international oil organisation such as Chevron had a weighted average interest rate of 0.12%. This explains how both the survey respondents and interviewees perceived the impact of interest on their operations.

The effect of exchange fluctuation achieved an average mean score (mean=3.16) which indicates that more respondents scored towards the average to high end of the Likert scale. The standard deviation (SD=1.094) was relatively small, indicating that there was not much deviation from the mean in the methods of scoring. This means that managers saw the effects of interest differently, depending on whether the organisation was local or international.

#### 6.3.2.5 Effect of liquidity and equity risks on the industry

Of the 70 respondents who took part in the study, 37% (n=26) agreed that liquidity risk had a high negative effect on the operations of companies in the Nigerian petroleum industry and could derail their attainment of set objectives as shown in Table 6.7 and Figure 6.9. Mr C, for example, remarked: *“In the face of [CBN] regulations in recent times, it is very difficult to obtain funds from the financial institutions”*, and Mr D lamented: *“There are so many projects that are on hold especially in the deep water area and you know they involve a lot of money.”* However, 34% (n=24), of the respondents agreed that the negative effect of liquidity risk on the operations of companies in the Nigerian petroleum industry was average while 29% (n=20) of respondents believed that the negative effect of liquidity risk on these companies was low and therefore would not derail their ability to achieve their objectives.

Liquidity risk generated a mean score of 3.06 and a standard deviation of 1.089, meaning that a simple majority of risk managers who took part in the survey believed

that liquidity risk should be managed and that opinions were congregated around the mean, as the standard deviation was relatively small.

The results in Table 6.7 and Figure 6.9 rank oil price fluctuations as the number one financial risk with regard to its effect on the industry; exchange rate as number two; demand and supply risk as number three; interest rate as number four; and liquidity as number five.

### 6.3.2.6 The Pearson correlation results

Pearson correlations were calculated between the financial risks and FRM success in order to assess the statistical significance of these relationships. The empirical results are reported in Table 6.8.

**TABLE 6.8: PEARSON CORRELATION RESULTS**

<b>Independent variables</b>	<b>FRM success (as dependent variable)</b>
Interest rate risk	0.08
Demand and supply risk	0.14
Liquidity risk	-0.03
Exchange rate risk	-0.01
Oil and gas price risk	0.05
Equity risk	-0.15
Cost of doing business risk	0.15

\*Note: Significant at  $p < 0.05$

Table 6.8 shows no positive significant relationship between interest rate risk, demand and supply risk, liquidity risk, exchange rate risk, oil and gas price risk, equity risk, the cost of doing business risk, on the one hand, and FRM success, on the other hand. This suggests that impact of these risks in the petroleum industry of Nigeria is not as much as managers perceived to be. This result does not seem to support the empirical results in sections 6.3.2.1 to 6.3.2.6 above. It could be that there was a difference between how managers qualitatively assessed the importance of these risks, on one hand, and how they quantified the importance of these risks, on the other hand. In future studies, the quantification of these risks for the petroleum industry should be explored so that the proper priority order should be established with regard to how these risks should be managed.

FRM success was measured in this study as the success that companies achieved in their methods of managing financial risk, in other words, how successful the companies were in (1) developing policy frameworks to manage financial risks, (2) identifying financial risks, (3) analysing FRM; (4) mitigating financial risks; and (5) communicating and controlling financial risks. The Pearson correlation results reveal that the current importance attached to the financial risks in the Nigerian petroleum industry does not translate into these elements of FRM success. This conclusion further supports the abovementioned assertion that more studies need to be conducted on the quantification of these risks in the petroleum industry so that the proper FRM strategies could be developed.

### 6.3.3 The impact of the financial risks on key performance variables of companies

The research question in this regard is as follows:

- *How do financial risks affect key performance variables in the petroleum industry in Nigeria?*

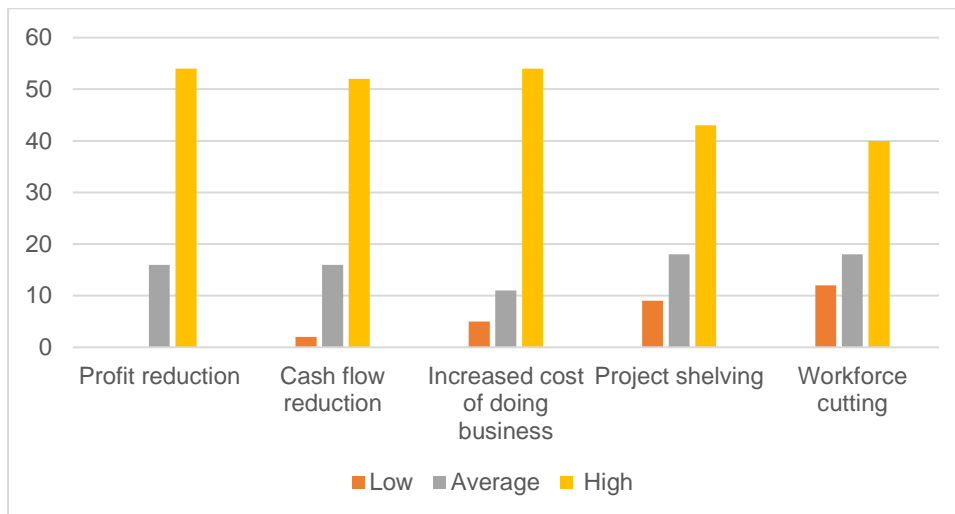
This section explores how financial risks affect variables such as profits, cash flow, the cost of doing business, completion of projects and the workforce. Descriptive statistics and Pearson correlations were calculated on the data collected and the empirical results are reported in Table 6.9 and Figure 6.10.

**TABLE 6.9: FINANCIAL RISK IMPACT ON KEY PERFORMANCE VARIABLES**

Impact	Low	Average	High	Mean	Rank	SD
Profit reduction	0	16	54	4.23	1	0.82
Cash flow reduction	2	16	52	3.94	3	0.76
Increased cost of doing business	5	11	54	4.04	2	0.89
Shelving of projects	9	18	43	3.54	5	0.99
Workforce cutting	12	18	40	3.60	4	1.12
<b>Average</b>	<b>5.6</b>	<b>15.8</b>	<b>48.6</b>	<b>3.87</b>		<b>0.92</b>



**FIGURE 6.10: FINANCIAL RISK IMPACT ON KEY PERFORMANCE VARIABLES**



#### 6.3.3.1 Impact of financial risks on reduction in profit

As shown in Table 6.9 and Figure 6.10, the majority (77%, n=54) of the respondents agreed that low oil and gas price, higher interest rates, low demand for commodity, and exchange rate fluctuation have reduced profitability in the Nigerian petroleum industry. This has a negative influence on companies' ability to achieve their strategic objectives.

This result achieved a high mean score (mean=4.21) which indicated that more respondents scored towards the high end of the Likert scale. The standard deviation (SD=0.80) was relatively small, indicating that there was not much deviation from the mean in the pattern of scoring, implying that profitability was hard hit by these financial risks.

Interviewees also agreed that reduction in profitability was negatively affected by financial risks. Mr A, of an upstream organisation, said, "*It affects the profit margin of the organisation and it also affects the cash flow.*" Mr B commented, "*It can impact the organisation in various ways, it can lead to a reduction in profit.*" Interviewees reported that the negative impact of financial risks in the industry have reduced profitability as the margin was being squeezed to the point that no new projects were taking place in the industry. Companies were divesting themselves of projects instead.

A review of various companies' income statements from 2012 to 2014 indicated that most companies experienced a significant drop in profit. For example, MRS Oil Nigeria PLC, reported a profit of N208 million in 2014, N746 000 in 2013 and N634 000 in 2014, while Shell reported US\$26.9 million in 2012, US\$16.5 million in 2013 and US\$14.7 million in 2014. For example, Total Nigeria PLC saw its profits drop from N1billion in 2014 to N0.2 billion in 2015, which is a 79% drop in profit. Thus, it can be said that the negative impact of financial risks on profitability on the Nigerian petroleum industry has reduced profitability and needs mitigation if companies are to remain in business.

#### 6.3.3.2 Impact of financial risks on increased cost of doing business

As illustrated in Table 6.9 and Figure 6.10, 77% (n=54) of the respondents agreed that the negative impact of financial risk factors have increased cost of doing business in the Nigerian petroleum industry was high. Approximately 16% (n=11) of respondents agreed that the negative impact of financial risk factors have increased the cost of

doing business in the industry was average, and 7% (n=5) of the respondents agreed that the negative impact of financial risks factors on the operation of companies in the petroleum industry with regard to the cost of doing business was low. Hence it appears that the majority of those who took part in the survey in the industry agreed that the negative impact of financial risks – such as price fluctuations, exchange rate fluctuations, and oil gluts – on the cost of doing business was high in the petroleum industry of Nigeria, and that this negative impact has eaten into profits and cash flow.

This result achieved a high mean score (mean=4.04) which indicated that more respondents scored towards the high end of the Likert scale, indicating that increased cost of doing business as a result of the financial risk effect in the industry was widespread. The standard deviation (SD=0.89) was relatively small, indicating that there was not much deviation from the mean in the pattern of scoring.

Interviewees confirmed that the cost of doing business has increased as result of the falling Naira against major trading partners' currencies. Mr B remarked: *"The local cost has been well managed with the structure that we have. Where we have bigger issues are the ones related to foreign cost in terms of getting capital and equipment in and that is ... most of the costs are denominated in um ... foreign currencies, so any slight exchange rate fluctuation can affect us heavily."*

The preceding comments imply that the depreciating Naira has increased the cost of importing equipment for projects. Most equipment in use in the oil industry is imported, and the continuing fall of the Naira against major currencies is increasing the cost of

doing business in the Nigerian petroleum industry. The effect was seen in companies' reports on capital investment. Chevron's return on capital employed in 2012, for example, was 18.7%, and 13.5% in 2013, while it was only 10.9% in 2014 (Chevron, 2014: 4). This indicates that the cost of doing business is eating deep into returns and that most companies have resorted to cost-cutting measures to stay afloat.

#### 6.3.3.3 Impact of financial risks on cash flows reduction

The results of the survey shown in Table 6.9 and Figure 6.10 reveal that 74% (n=52) of the respondents agreed that financial risk factors have reduced cash flows in the operation of companies in the Nigerian petroleum industry. About 23% (n=16) of the respondents believed that the negative impact on their companies' cash flow was average while only 3% (n=2) of the respondents believed that the negative impact of the financial risk factors on reduction of cash flows was low.

Interviewees supported the view that financial risks have a negative influence on the cash flow of their businesses. Mrs E remarked, "*Right now, as I speak, there are some workers that are due for payment of housing scheme that has not been paid due to cash flow.*" This indicates that cash flow had taken a severe blow from the negative impact of financial risks, to the point of leaving Nigerian oil and gas sectors companies with less cash to make payments when due. Mr C, who is the financial risk manager of a downstream organisation in the Nigerian petroleum industry remarked, "*Yes, it has impacted the cash flow. Right now we utilise what we have within the reach of the organisation rather than longing for finances. So because of that it also reduces the*

*rate of our activities in the business. As it stands now, it is very difficult to give facilities to the customers because we are not getting facilities from the banks. In recent times the Central Bank of Nigeria policies have made the impact to be on the higher side.”*

The preceding comment indicates that the effect of financial risks has made it impossible to borrow from banks and has also meant that customers in the industry are no longer given credit. Investment in new projects has also suffered as a result of low cash flow in companies.

A high mean score (mean=3.94) in the results indicates that more respondents agreed that there was a high negative impact of financial risks on cash flow in companies. The standard deviation (SD=0.76) was relatively small, indicating that there was not much deviation from the mean in the pattern of scoring, which showed a high level of agreement on this issue by the respondents.

The content analysis of oil companies' annual reports from 2012 to 2014 revealed the following:

Chevron's cash flow for 2012 was US\$20 million; for 2013 it was US\$16 million, and for 2014 it was US\$12 million. This downward movement could be the result of the effect of financial risks (Chevron, 2014:34). The cash flow of Forte Oil PLC for 2013 was N1.8 billion, while for 2014 it was N434 000 in the negative (Forte, 2014:35). These financial figures further support the empirical findings of the study that the

negative impact of financial risk factors on cash flows are serious in the Nigerian petroleum industry.

#### 6.3.3.4 Impact of financial risks on workforce cutting

As shown in Table 6.9 and Figure 6.10, 57% (n=40) of the respondents agreed that the negative impact of financial risk factors have led to a number of companies laying off workers in the petroleum industry of Nigeria. About 26% (n=18) of the respondents agreed that the negative impact of financial risk factors was average, while 17% (n=12) agreed that the impact was low.

The majority view was upheld by interviewees. Mr A of an upstream oil organisation stated, *"As I am speaking we are actually cutting the workforce."* Although Mr C's organisation, at the time of the interview was not cutting back on its workforce, it was reducing staff through natural attrition. He remarked: *"We are not retrenching right now but we are not replacing staff that are leaving. For example, Schlumberger has cut up to eleven hundred staff across the world and it also affected hundreds of staff in Nigeria because of international oil price."* These remarks suggest that workforce cutting is presently the industry norm in the Nigerian petroleum industry as captains of the industry were trying to weather the negative impact of financial risks. Mr D concurred, stating: *"When an organisation tells you 'I want to sack or lay off um ... two hundred staff', this day we cannot say you cannot do that."* In validation of these comments, the Halliburton organisation has cut about 29 000 of its workforce worldwide due to

the plummeting crude price, resulting in two Nigerian unions halting their operations in Nigeria (Bloomberg, 2015).

The abovementioned results achieved a high mean score (mean=3.60) which indicates that more respondents scored towards the high end of the Likert scale to show that the level of workforce reduction was high in the industry owing to financial risks. The standard deviation (SD=1.12) was relatively small, indicating that there were not many differences between high and low from the mean, which implies that the industry today faces a significant problem of workforce cutting as a result of the negative impact of financial risks.

#### 6.3.3.5 Impact of financial risks on project shelving

Table 6.9 and Figure 6.10 indicated that 61% (n=43) of the respondents in the survey were of the opinion that the negative impact of financial risk factors was responsible for widespread project shelving in the petroleum industry of Nigeria. This was followed by 26% (n=18) respondents who agreed that the negative impact of financial risk factors on the industry in this regard was average, while 13% (n=9) were of the opinion that the negative impact of financial risk factors leading to project shelving in their companies was low.

This result achieved a high mean score (mean=3.54) which indicated that more respondents agreed that the negative impact of financial risks led to project shelving in their companies. The standard deviation (SD=0.92) was relatively small, indicating

that there was not much deviation from the mean in the pattern of scoring. This indicated a high level of agreement around this issue.

Interviewees confirmed the survey results. Mr A, for example, noted, *“Some of the projects have been put on hold because of the impact of financial risk.”* Mr D commented, *“There are no new projects going on in the oil and gas sector in the last um ... four years, we have not, we have not had a new, any new well, so in fact what we are doing now is projects in the Obasanjo regime because that is the last time we have ever have any serious investment in oil and gas sector. Instead of talking about the new investment, we are divesting; Shell has divested most of the oil wells.”*

Mr D's comments signify that increasing investment in the industry was not on the cards in these periods of low oil prices. His comments also indicated that the depreciating Naira had caused companies to be obliged to pay more for the importation of equipment needed for new oil wells. New projects were being shelved as a consequence of this situation. Furthermore, his comments suggested that the companies were divesting themselves of the maintenance costs of equipment while trying to survive the prolonged oil price downturn. Mr D stated: *“There are so many projects that are on hold, especially in the deep water area and, you know, they involve a lot of money. If I as an organisation, let say Chevron for instance, I want to go to the traditional money market to borrow money and the other person that supposed to contribute the sixty per cent is not doing anything, you see the risk involved? On what basis am I borrowing?”* These comments indicate that projects which had been intended to come on-stream were now on hold because of the negative effect of



financial risks on companies and on the country. The NNPC was unable to pay its share of the joint venture contracts for new projects.

In 2013, the Eni Annual Report (2013:95) tabled its approval of US\$54 billion capital expenditure based on a projected price of US\$90 a barrel for the period 2014–2017. However, in the oil price environment of US\$44.50 a barrel in January 2015, these capital projects were not profitable anymore as they may yield a net negative net present value. In addition, multinational oil giant, Shell, deferred capital investment of US\$12 billion earmarked for the Bonga South-West project in deep-water Nigeria because of the prolonged drop in oil prices. These industry statistics supported the belief that widespread project shelving in the industry was taking place as a result of the negative impact of the financial risks on the operations of companies.

The results showed profit reduction as the most affected key performance variable in the petroleum industry of Nigeria. Increase in cost of doing business is rated second, cash flow reduction is rated third, workforce cutting is rated fourth, and project shelving is rated fifth.

#### 6.3.3.6 The Pearson correlation results

Pearson correlations were calculated to quantify the perceived relationship between the identified financial risks and key performance variables in the companies. The empirical results were reported in Table 6.10.

**TABLE 6.10: THE INFLUENCE OF FINANCIAL RISKS ON KEY PERFORMANCE VARIABLES – THE PEARSON CORRELATION RESULTS**

<b>Key performance variables</b>	<b>Forex</b>	<b>Commodity prices</b>	<b>Interest rates</b>	<b>Demand &amp; supply</b>	<b>Liquidity &amp; equity</b>
Profit reduction	0.41*	0.38*	0.12	0.25*	0.15
Cash flow reduction	0.29*	0.29*	0.29*	0.29*	0.29*
Cost of doing business	0.26*	0.26*	0.26*	0.26*	0.26*
Shelving of Project	0.11	0.11	0.11	0.11	0.11
Workforce cutting	0.11	0.11	0.11	0.11	0.11

Note: \* indicates significance at  $p < 0.05$

The Pearson correlation results largely support the views of the respondents expressed in sections 6.3.3.1 to 6.3.3.5 above. The results reveal that profitability, cash flow, and cost of doing business were significantly influenced by all the negative effects of the financial risks. The respondents were, therefore, entirely correct in their assessment that all the financial risks exerted an influence on key performance variables such as profitability, cash flow, and cost of doing business in the Nigerian petroleum industry.

The Pearson correlation results, however, show that the financial risks were not significantly related to shelving of project or to workforce cutting as key performance variables. Once again, this indicated a possible dissonance between respondents' qualitative assessments of the effect of these risks on these key performance variables on one hand, and how they quantified these effects on the other hand. This could also

present an interesting area for future research. The question that needed to be answered was whether a proper quantification of the effect of financial risks on project completions (versus shelving) and workforce reductions, was taking place.

#### **6.3.4 Challenges in FRM that oil and gas companies encounter in Nigeria**

The research question in this regard is as follows:

- **What are the challenges in FRM that oil and gas companies encounter in Nigeria?**

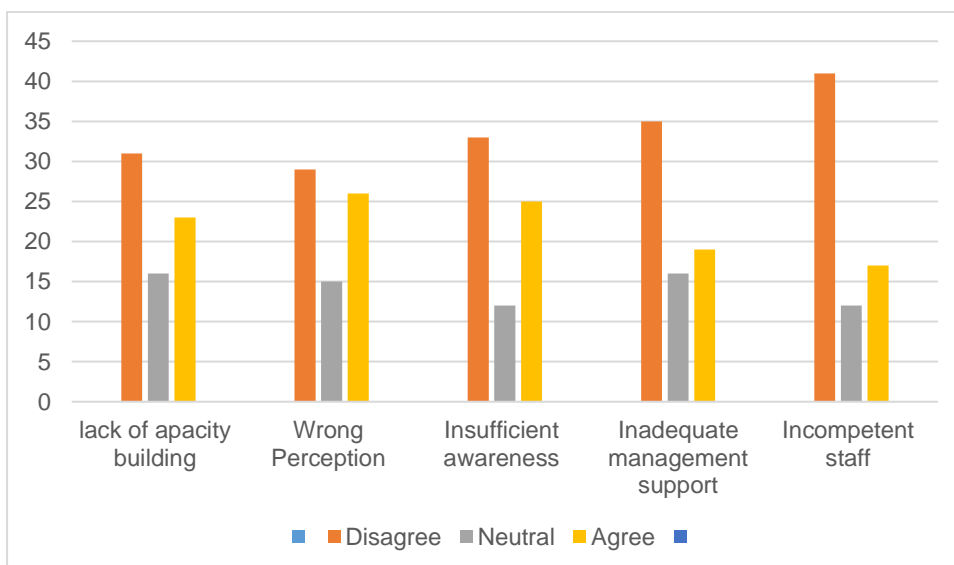
This section explored the challenges faced by the Nigerian petroleum industry in its efforts to limit financial risks that were negatively affecting them. Selected challenges faced by companies operating in the Nigerian petroleum industry in the implementation of their FRM system are outlined and discussed in this section. From the literature review in Chapter 2, the following challenges were identified: incompetent staff, insufficient awareness, inadequate management support, incorrect perceptions around FRM, and lack of capacity building. Descriptive statistics were calculated to ascertain to what extent these challenges were prevalent in the Nigerian petroleum industry. The results are reported in Table 6.11 and Figure 6.11. Pearson correlations were calculated to investigate the relationship between these challenges and FRM success, and these results are reported in Table 6.12.

**TABLE 6.11: FINANCIAL RISK MANAGEMENT CHALLENGES IN THE NIGERIAN PETROLEUM INDUSTRY**

	Dis-agree	Neutral	Agree	Mean	Rank	SD
Lack of capacity building	31	16	23	3.01	1	1.19
Wrong perceptions	29	15	26	2.94	2	1.06
Insufficient awareness	33	12	25	2.87	3	1.18
Inadequate management support	35	16	19	2.76	4	1.17
Incompetent staff	41	12	17	2.40	5	1.23
<b>Average</b>	<b>33.8</b>	<b>14.2</b>	<b>22</b>	<b>2.79</b>		<b>1.17</b>

1 =Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree and 5 = Strongly agree

**FIGURE 6.11: FINANCIAL RISK MANAGEMENT CHALLENGES IN THE NIGERIAN PETROLEUM INDUSTRY**



#### 6.3.4.1 Lack of capacity building

According to the mean score (3.01) of responses (see Table 6.11 and Figure 6.11), this appears to be the most important FRM challenge in the Nigerian petroleum industry. The empirical results, however, show that 33% (n=23) of respondents agreed that lack of capacity building for FRM was a problem in the industry, while 44% (n=31) disagreed with that statement. The remaining 23% (n=16) of the respondents opted to be neutral on the issue.

This result achieved an average mean score (mean=3.01) which indicated that more respondents disagreed that lack of capacity building is a challenge in the industry. The standard deviation (SD=1.19) was relatively small, indicating that there was not much deviation from the mean in the pattern of scoring. This indicated an average level of agreement around this issue.

Data from interviewees provided more information on the issue of lack of capacity building. It emerged from the interviews that the government's inability to fund joint venture contracts, the operation of an outdated regulatory framework, as well as the much-awaited Petroleum Industry Bill were issues affecting capacity building that were not considered by the structured questionnaire. Corruption in the system, as far as it related to subsidy payment for imported petroleum products, was an issue affecting capacity building in the industry, for example. There were also the nonstop beneficiation demands by host communities that destabilised companies' financial risk plans, the opacity of operations, oil theft, and vandalising of the companies'

infrastructure that required specific capacities from companies. Specialised capacities were also required by international companies that found the management of cultural differences, both individual and organisational, a challenge.

Mr D, for example, commented, *"The biggest problem we have in the industry today has to do with the fact that government cannot pay its own part of the funding for the industry. We have, as we are talking today, we still have laws that were promulgated in 1990, 1960, you know, they still being used."* Mr A said, *"Shortage of funding comes about as result of, especially as our business is joint venture operation and so the funding which is mainly the government is actually affecting the operation and cultural differences, the Nigeria. The state is not particularly, is not economically friendly."* This means that Mr A's operation was limited by the terms and conditions of the joint venture and, as a minority shareholder, it created a problem for companies if government as the majority shareholder, did not provide funding for projects. The cultural differences between Nigeria and the international oil organisation was another challenge in the management of financial risks.

Mr C lamented: *"There is a kind of corruption that [is] actually delaying the payment of the subsidy to the importers of fuel ... Along the line when you are planning the approach to resolving them, you start seeing government policy coming around again."*

This refers to corruption in the subsidy payments to oil importers in the industry; with government policies changing regularly, companies could not manage financial risk in the petroleum industry of Nigeria effectively. Mr D noted: *"There is so much opacity in the way oil business is conducted in Nigeria. That is, you can never get to know the*

*truth, even as we are talking, it will interest you to note that we do not know how many barrels of crude oil that we are really producing and selling every day and community vandalising pipelines and oil theft."* Mr D's comments refer to oil production and sales being conducted in secrecy, as well as to community vandalising of infrastructure, as some of the challenges facing the industry in limiting financial risks.

#### 6.3.4.2 Wrong perceptions

According to the mean score (2.94) of responses (see Table 6.11 and Figure 6.11), this appears to be the second most important FRM challenge in the Nigerian petroleum industry. The empirical results however show that 37% (n=26) of respondents agreed that wrong perception of FRM was a problem in the industry, while 42% (n=29) disagreed with that statement. The remaining 21% (n=15) of the respondents opted to be neutral on the issue.

This result achieved an average mean score (mean=2.94) which indicated that more respondents disagreed that wrong perception is a challenge in the industry. The standard deviation (SD=1.04) was relatively small, indicating that there was not much deviation from the mean in the pattern of scoring. This indicated an average level of agreement around this issue.

Mr B of both downstream and upstream organisations commented that *"Well I mean is more about the perception of the risk as a business, if we perceive the risk as an important area we need to focus on then we won't have much of an issue. And getting*

*the staff to also see the risk is an important challenge.*" This statement alludes to the fact that that getting employees to understand the important of a risk is a challenge to his organisation.

#### 6.3.4.3 Insufficient awareness

According to the mean score (2.87) of responses (see Table 6.11 and Figure 6.11), this appears to be the third most important FRM challenge in the Nigerian petroleum industry. The empirical results however show that 36% (n=25) of respondents agreed that insufficient awareness of FRM was a problem in the industry, while 47% (n=33) disagreed with that statement. The remaining 17% (n=12) of the respondents opted to be neutral on the issue.

This result achieved low mean score (mean=2.87) which indicated that more respondents disagreed that insufficient awareness is a challenge in the industry. The standard deviation (SD=1.17) was relatively small, indicating that there was not much deviation from the mean in the pattern of scoring. This indicated an average level of agreement around this issue.

Mr C's comment indicates that there was sufficient awareness, especially among management staff, in his establishment when he stated: *"There is sufficient awareness of financial risk, especially among the managers because our operation is highly liquid when it comes to finances. So if there is [a] little manhandling of situation then it can trigger lot of problems"*.



#### 6.3.4.4 Inadequate management support

According to the mean score (2.76) of responses (see Table 6.11 and Figure 6.11), this appears to be the fourth most important FRM challenge in the Nigerian petroleum industry. The empirical results however show that 27% (n=19) of respondents agreed that inadequate management support for FRM was a problem in the industry, while 50% (n=35) disagreed with that statement. The remaining 23% (n=16) of the respondents opted to be neutral on the issue.

This result achieved a low mean score (mean=2.76) which indicated that more respondents disagreed that inadequate management support is a challenge in the industry. The standard deviation (SD=1.17) was relatively small, indicating that there was not much deviation from the mean in the pattern of scoring. This indicated an average level of agreement around this issue.

Mrs E of an upstream organisation commented, "*Management support in terms of providing the resources; if you said that risk should be averted and you do not provide the resources with which to avert the risk, then at the end of the day the staff will not be able to do their work*". This statement alludes to the fact that management support in providing the required resources to make the FRM process more effective in these companies could be lacking.

#### 6.3.4.5 Incompetent staff

According to the mean score (2.40) of responses (see Table 6.11 and Figure 6.11), this appears to be the fifth most important FRM challenge in the Nigerian petroleum industry. The empirical results however show that 24% (n=17) of respondents agreed that incompetent staff was a problem in the industry, while 59% (n=41) disagreed with that statement. The remaining 17% (n=12) of the respondents opted to be neutral on the issue.

This result achieved a low mean score (mean=2.4) which indicated that more respondents disagreed that incompetent staff is a challenge in the industry. The standard deviation (SD=1.23) was relatively small, indicating that there was not much deviation from the mean in the pattern of scoring. This indicated an average level of agreement around this issue.

Only Mrs E, of an upstream organisation, observed, *"Some people, despite training they are incompetent, they cannot put to practice what has been taught, you know. Sometimes, it is a lack of understanding because they do not have the understanding of whatsoever management has put across to them"*. From her comments, it can be deduced that the challenge of incompetency was of concern to her establishment.

The finding regarding challenges of financial risk management showed that lack of capacity building was the most serious challenge, followed by wrong perceptions

which ranked second, insufficient awareness ranked third, and inadequate management support followed by incompetent staff.

#### 6.3.4.6 Pearson correlation results

Pearson correlations were calculated to ascertain whether these challenges have significant negative influences on FRM success. This calculation was necessary to clear up the confusion in sections 6.3.4.1 to 6.3.4.4 above, namely that the descriptive statistics indicated that the selected challenges were not seen as such by the majority of respondents, while the interviewees indicated otherwise. The empirical results of the Pearson correlations are reported in Table 6.12.

**TABLE 6.12: THE CHALLENGES FOR EFFECTIVE FINANCIAL RISK MANAGEMENT IN THE NIGERIAN PETROLEUM INDUSTRY – THE PEARSON CORRELATIONS**

<b>Challenges</b>	<b>FRM success</b>
Incompetent staff	0.13
Insufficient awareness of financial risks	-0.06
Inadequate management support	-0.04
Lack of capacity building	-0.13

Note: \*indicates a significant relationship at  $p < 0.05$

The empirical results (Table 6.12) revealed that the selected challenges were not significantly related to FRM success. This means that these variables were not seen as having a significant influence on FRM success.

This result could again reflect the situation that what respondents qualitatively believed did not match the quantification thereof. This indicated once again a need for future research on the quantification of the issues around FRM in the Nigerian petroleum industry. Such quantification could be important in order to conclusively investigate statistical relationships between important variables in the industry.

### **6.3.5 Critical success factors for a strategic FRM in the petroleum industry in Nigeria**

The research question in this regard is as follows:

- **What are the critical success factors for a strategic FRM in the petroleum industry in Nigeria?**

This section explored factors that might be critical for the effective management of financial risks in the Nigerian petroleum industry. These critical success factors were identified from the literature review, (see section 4.2.7.1) conducted on the issues. The literature indicated that there were six important variables that were of critical importance in companies in order to manage financial risks in any companies, namely top management support, FRM culture, communication flow, information technology, organisational structure, and training and development. This section explored to what extent this assertion held true for the respondents in this study.

In the present study, the first four variables (top management support, FRM culture, communication flow and information technology) were measured as latent variables, while the remaining three (organisational structure, training and development, and oversight and control) were measured as nominal variables.

The four latent variables were operationalised as follows:

**Top management support:** the extent to which the top management of an organisation was effective in achieving the following in the context of FRM:

- formulation of FRM policy;
- dedication to achieving;
- provision of sufficient funding to achieve; and
- responsibility for the oversight and control.

**FRM culture:** the extent to which an organisation any enabled the achievement of:

- strategic objectives;
- improved decision-making;
- increased participation and collaboration; and
- greater awareness.

**Communication flow:** the extent to which an organisation's communication flow supported (assisted in) the following in the context of FRM:

- timely identification;
- Policies dissemination;

- decision-making; and
- control measures.

**Information technology:** the extent to which an organisation used information technology to support (assist in) the following FRM-related areas:

- corporate governance;
- environmental scanning;
- risk ranking and analysis; and
- risk mitigation and control.

The nominal variables were operationalised as follows:

**Organisational structure:** what kind of FRM organisational structure is in operation in your organisation?

- Flat structure
- Hierarchical structure
- Matrix structure
- Centralised structure.

**Training and development:** my organisation organises training and development to improve FRM as often as:

- Once a year
- Twice a year
- More than twice a year

- Never.

Oversight and control: have saved my organisation from the following risks:

- Change in regulations risk
- Unauthorised risk taking
- Reputational risk
- Reserve recalculation risk.

**FRM success**, the dependent variable, was operationalised as the success that companies achieved in:

- developing policy frameworks to manage financial risks;
- identifying financial risks;
- analysing financial risks;
- mitigating financial risks; and
- communicating and controlling financial risks.

#### 6.3.5.1 The relationship between the latent variables and FRM success

First, the reliability of the measuring instruments of the latent variables was assessed by the calculation of the Cronbach alphas of data that emerged from these instruments. Table 6.13 showed that all the Cronbach alpha values exceeded 0.68, which was higher than the minimum cut-off point for the fair reliability of Zikmund, Babin, Carr and Griffin (2013). This minimum cut-off point was 0.60. This meant that the instruments used to measure the independent and dependent variables

operationalised above exhibited sufficient reliability to proceed with further data analyses.

**TABLE 6.13: RELIABILITY OF INSTRUMENTS – CRONBACH ALPHA VALUES**

<b>Variables</b>	<b>Alpha value</b>
Top management support	0.77
FRM culture	0.88
Communication flow	0.91
Information technology	0.87
FRM success	0.68

Second, two sets of exploratory factor analyses were conducted to ascertain the discriminant validity of the independent and dependent variables. It was postulated that the four independent variables (top management support, FRM culture, and communication flow and information technology) constitute four distinctly different constructs and that the dependent variable (FRM success) was a unidimensional construct. Principal components were specified as the method of factor extraction and Varimax Raw rotation of the original factor matrix was used. The empirical results were reported in Tables 6.14 and 6.15. The results reveal that exploratory factor analyses supported the contention that there were four distinctly separate independent variables (Table 6.14) and one unidimensional dependent variable (Table 6.15).



**TABLE 6.14: EXPLORATORY FACTOR ANALYSIS RESULTS – INDEPENDENT VARIABLES**

<b>Measuring items</b>	<b>Factor 1 Communication flow</b>	<b>Factor 2 Top management support</b>	<b>Factor 3 Information technology</b>	<b>Factor 4 FRM culture</b>
TOPMGT1	0.223804	<b><i>0.724996</i></b>	0.246729	0.255045
TOPMGT2	0.194316	<b><i>0.565764</i></b>	0.005100	0.370286
TOPMGT3	0.319376	<b><i>0.708652</i></b>	-0.089804	0.187966
TOPMGT4	-0.025051	<b><i>0.786919</i></b>	0.227325	0.139605
FRMCULT1	0.252291	0.156326	0.063653	<b><i>0.851140</i></b>
FRMCULT2	0.119325	0.203941	0.233103	<b><i>0.839964</i></b>
FRMCULT3	0.257807	0.164625	0.147115	<b><i>0.784506</i></b>
FRMCULT4	0.113461	0.123424	0.459084	<b><i>0.672933</i></b>
COMMU1	<b><i>0.789828</i></b>	0.090913	0.329470	0.286779
COMMU2	<b><i>0.749534</i></b>	0.102056	0.352728	0.202118
COMMU3	<b><i>0.829132</i></b>	0.055337	0.271019	0.214087
COMMU4	<b><i>0.854092</i></b>	0.230273	0.129453	0.093964
ITIMPAC1	0.391843	0.170920	<b><i>0.607200</i></b>	0.226987
ITIMPAC2	0.355105	0.087182	<b><i>0.769723</i></b>	0.096951
ITIMPAC3	0.199279	0.091938	<b><i>0.837462</i></b>	0.259344
ITIMPAC4	0.294390	0.108567	<b><i>0.791047</i></b>	0.142382
Expl.Var	3.356282	2.207326	3.022872	3.081458
Total	0.209768	0.137958	0.188930	0.192591

Note: Numbers in bold and italicised indicate significant loadings at > 0.50

Table 6.14 shows that the four measuring items that measured top management support loaded on Factor 2. TOPMGT1 to TOPMGT4 were therefore regarded as valid measuring items of the independent variable, top management support.

Table 6.14 also shows that the four measuring items that measured FRM culture loaded on Factor 4. FRMCULT 1 to 4 was therefore regarded as valid measures of the independent variable, FRM culture. Similarly, the four measuring items that measured communication flow loaded on Factor 1. COMMU1 to 4 were therefore regarded as valid measures of the independent variable, communication flow.

Finally, Table 6.14 reveals that the four measuring items that measured information technology loaded on Factor 3. The items ITIMPAC1 to 4 were therefore regarded as valid measures of the independent variable, information technology.

**TABLE 6.15 EXPLORATORY FACTOR ANALYSIS RESULTS – DEPENDENT VARIABLE**

<b>Measuring items</b>	<b>Factor 1 FRM success</b>
FRMSUCC1	<b><i>-0.802382</i></b>
FRMSUCC2	<b><i>-0.734065</i></b>
FRMSUCC3	<b><i>-0.546464</i></b>
FRMSUCC4	<b><i>-0.586260</i></b>
FRMSUCC5	<b><i>-0.626683</i></b>
Expl.Var	2.217723
Total	0.443545

Note: Numbers in bold and italics indicate significant loadings at > 0.50

With regard to the second set of exploratory factor analyses (Table 6.15), all the FRM success measuring items loaded as expected. All five FRMSUCC items loaded on Factor 1 and were therefore regarded as valid measures of FRM success.

In pursuit of the research question formulated at the start of section 6.3.5, the following hypotheses were investigated:

H1 Top management support is positively related to FRM success in Nigerian petroleum organisations.

H2 An FRM-supporting culture is positively related to FRM success in Nigerian petroleum organisations.

H3 An FRM-supporting communication flow is positively related to FRM success in Nigerian petroleum organisations.

H4 FRM-supporting information technology is positively related to FRM success in Nigerian petroleum organisations.

Multiple regression analyses were conducted to investigate these hypotheses. The STATISTICA Version 10 (2011) computer software program was used to conduct these analyses. The empirical results thereof are reported in Table 6.16.

Table 6.16 shows that top management support was significantly positively ( $r=0.35$ ,  $p < 0.01$ ) related to FRM success. The hypothesis H1 is therefore supported by the empirical results. This means that the more this type of top management support and leadership is provided by these organisations, the more successful they will be at FRM.

**TABLE 6.16: HYPOTHESISED RELATIONSHIPS – EMPIRICAL RESULTS**

<b>Dependent variable: FRM SUCCESS</b>						
R <sup>2</sup> = 0.444						
F(4,65) = 12.978, p < 0.001						
	<b>b*</b>	<b>Std. error - of b*</b>	<b>B</b>	<b>Std. error - of b</b>	<b>t(65)</b>	<b>p-value</b>
Intercept			1.348873	0.366759	3.677816	0.000479
TOPMGT	0.353468	0.112725	0.283067	0.090273	3.135676	0.002575**
CULTU	0.021570	0.121780	0.019148	0.108107	0.177118	0.859966
COMM	0.256934	0.128437	0.178770	0.089364	2.000475	0.049630*
ITIMPAC	0.190740	0.127726	0.148684	0.099564	1.493356	0.140183

Note: \*Relationship significant at p < 0.05

\*\*Relationship significant at p < 0.01

Table 6.16 further shows that FRM culture was not significantly ( $r=0.02$ ,  $p > 0.05$ ) related to FRM success. The hypothesis H2 is therefore not supported by the empirical results. This means that the existing FRM culture in these organisations has no influence on their FRM success. It is important for the responsible managers to take note that their current actions to create a conducive FRM culture were not having the influence that they desired. They might need to consider alternative actions or investigate why the current actions were not delivering the desired results.

Significantly, the empirical results (Table 6.16) indicate that communication flow ( $r=0.26$ ,  $p < 0.05$ ) was positively related to FRM success. The hypothesis H3 is therefore supported by the empirical results. This means that the more this type of communication flow is practised in these organisations, the more successful they will be with FRM. It is therefore imperative that this type of communication flow be encouraged in organisations if strategic FRM is to be achieved.

Table 6.16 further reveals that information technology was not significantly related to FRM success. The hypothesis H4 is therefore not supported by the empirical results. This means that the current information technology support in FRM did not play a significant role in FRM success in Nigerian petroleum organisations. It is important for the responsible managers to investigate why current IT support is not playing a significantly positive role in achieving FRM success.

Finally, the empirical results of multiple regression analyses (Table 6.16) reveal that the four independent variables – top management support, FRM culture, communication flow, and information technology – collectively explained 44% ( $r^2=0.444$ ) of the variance in FRM success (the dependent variable). Other variables not measured in this study therefore explained 56% of the variance in the dependent variable. The four independent variables were therefore important determinants of FRM success and were deserving of attention by the responsible managers in these organisations. However, in this study, only top management support and communication flow were critical success factors in achieving FRM success.

#### 6.3.5.2 The relationship between the nominal variables and FRM success

In pursuit of the research question formulated at the start of section 6.3.5, the following hypotheses were investigated.

Hypothesis 5: A centralised organisational structure is negatively related to FRM success in Nigerian petroleum organisations.

Hypothesis 6: FRM-Frequency of supporting training and development is positively related to FRM success in Nigerian petroleum organisations.

First, the results concerning the relationship between organisational structure and FRM success are reported.

*FRM organisational structure*

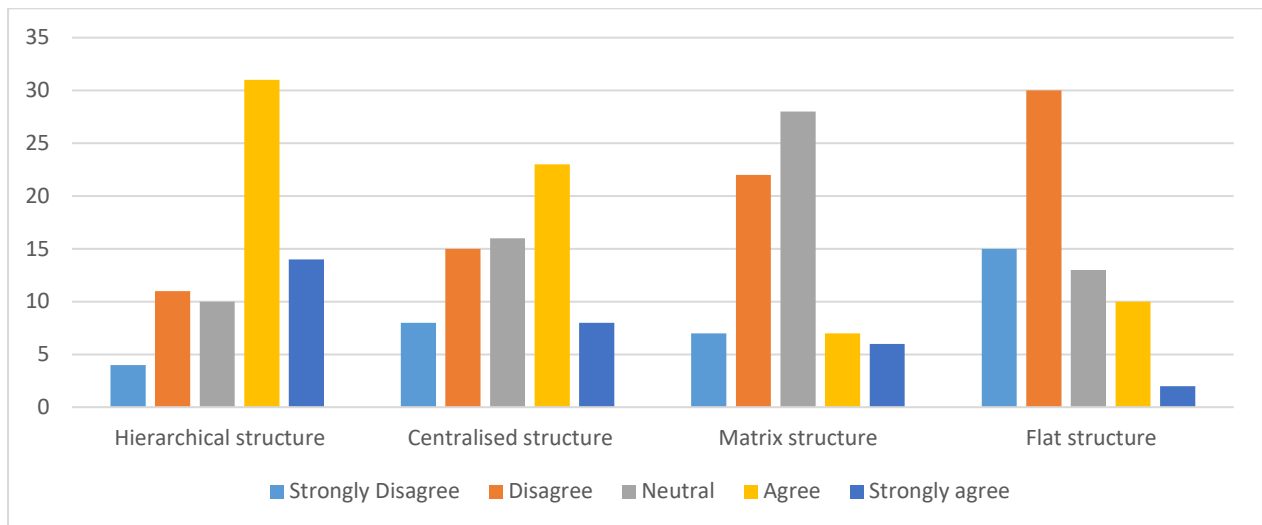
Descriptive statistics were calculated to establish what type of FRM organisational structure is prevalent in Nigerian petroleum organisations. The results are reported in Table 6.17 and Figure 6.12. Table 6.17 shows that most respondents reported the use of a hierarchical FRM organisational structure, followed by a centralised, matrix and flat structure.

**TABLE 6.17: FRM ORGANISATIONAL STRUCTURE**

Type of structure	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	Rank	STD
Hierarchical structure	4	11	10	31	14	3.57	1	1.149
Centralised structure	8	15	16	23	8	3.11	2	1.21
Matrix structure	7	22	28	7	6	2.76	3	1.055
Flat structure	15	30	13	10	2	2.34	4	1.062

1 =Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree and 5 = Strongly agree

**FIGURE 6.12: FRM ORGANISATIONAL STRUCTURE**



Pearson correlations were calculated to investigate which FRM organisational structure correlates most strongly with FRM success. The results of this analysis are reported in Table 6.18.

Table 6.18 reveals that only the matrix structure is significantly related to FRM success. This means that the more the matrix organisational structure is in use, the more FRM success will be achieved. This result does not support hypothesis H5 that a highly centralised organisational structure is negatively related to FRM success. The empirical results indicate a negative relationship, but this relationship is not statistically significant. The results show that a matrix structure should be preferred for the achievement of FRM success.

**TABLE 6.18: THE RELATIONSHIP BETWEEN ORGANISATIONAL STRUCTURE AND FRM SUCCESS**

Type of structure	FRM success
Hierarchical structure	0.13
Centralised structure	-0.13
Matrix structure	0.28*
Flat structure	0.01

Indicates a significant relationship at  $p < 0.05$

### *Training and development*

Next, the results concerning the relationship between training and development and FRM success are reported.

Descriptive statistics were calculated on how regularly FRM training and development is conducted in Nigerian petroleum organisations. The results are reported in Table 6.19 and Figure 6.13, which shows that most respondents report that FRM training and development occurs annually in their organisations. The next most frequently occurring figure was more than twice per annum, followed by twice per annum. Seven of the organisations had never provided FRM training and development.

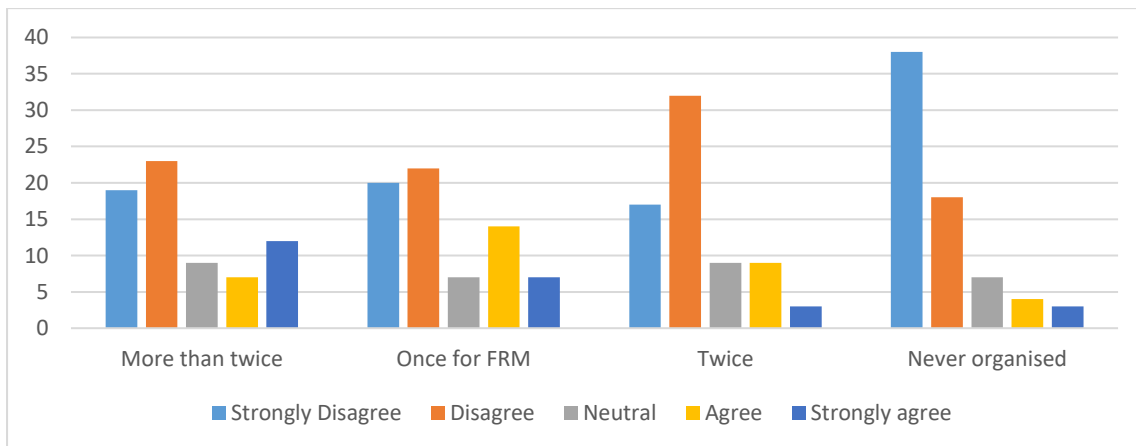


**TABLE 6.19: FREQUENCY OF FRM TRAINING AND DEVELOPMENT**

Frequency	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Rank
Once per annum	20	22	7	14	7	1
Twice per annum	17	32	9	9	3	3
More than twice per annum	19	23	9	7	12	2
Nil times per annum	38	18	7	4	3	4

1 =Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree and 5 = Strongly agree

**FIGURE 6.13: FREQUENCY OF FRM TRAINING AND DEVELOPMENT**



Pearson correlations were calculated to investigate which training and development frequency correlates most strongly with FRM success. The results of this analysis are reported in Table 6.20.

Table 6.20 shows that more than twice per annum is significantly positively ( $r=0.32$ ,  $p < 0.05$ ) related to FRM success. This means that if FRM training and development

occurs more than twice per annum in a organisation, more FRM success will be achieved.

**TABLE 6.20: THE RELATIONSHIP BETWEEN TRAINING AND DEVELOPMENT FREQUENCY AND FRM SUCCESS**

<b>Training and development frequency</b>	<b>FRM success</b>
Once per annum	-0.01
Twice per annum	-0.85
More than twice per annum	0.32*
Nil times per annum	-0.36*

Indicates a significant relationship at  $p < 0.05$

Table 6.20 also reveals that no training and development is significantly negatively ( $r=-0.36$ ,  $p < 0.05$ ) related to FRM success. This means (unsurprisingly) that if FRM training and development never occurs in organisations, FRM success will not be achieved. FRM training and development must therefore take place in Nigerian petroleum companies and preferably more frequently than twice per annum. These results support hypothesis H6 that training and development is positively related to FRM success.

### *Oversight and control*

Descriptive statistics were calculated on how FRM oversight and control has reduced financial risks in Nigerian petroleum organisations. The results are reported in Table

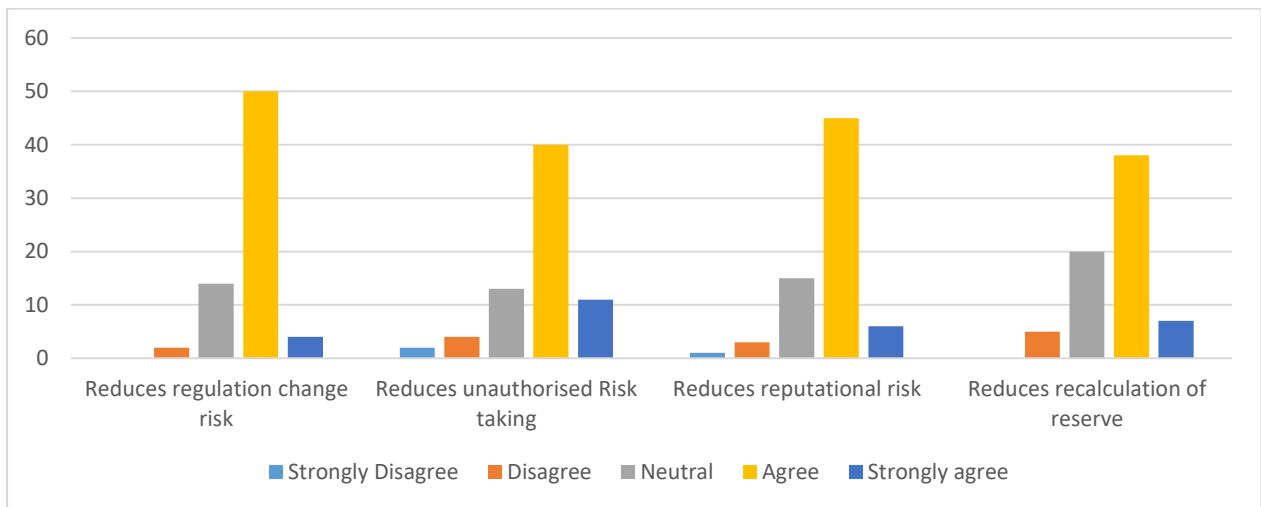
6.21 and Figure 6.14, which show that most respondents report that FRM oversight and control has reduced regulatory change financial risk which is the most rated variable. The next most rated variable was the reduction in unauthorised risk taking, followed by reduction in reputational risk. The last rated variable is the reduction of reserve recalculation risk.

**Table 6.21: FRM OVERSIGHT AND CONTROL**

	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly agree</b>	<b>Mean Score</b>	<b>Rank</b>
Regulation change risk	0	2	14	50	4	3.8	1
Unauthorised Risk taking	2	4	13	40	11	3.77	2
Reputational risk	1	3	15	45	6	3.74	3
Recalculation of reserve	0	5	20	38	7	3.67	4
<b>Average</b>	<b>0.75</b>	<b>3.5</b>	<b>15.5</b>	<b>43.25</b>	<b>7</b>	<b>3.745</b>	

1 =Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree and 5 = Strongly Agree

**Figure 6.14: FRM OVERSIGHT AND CONTROL**



Pearson correlations were calculated to investigate which financial risk correlates most strongly with FRM success. The results of this analysis are reported in Table 6.22. This means that the more oversight and control is implemented to protect the organisation against unauthorised risk-taking, change in regulation reputational risk and reserve recalculation risk, the more successful the organisation’s method of FRM is going to be favourable to the organisations in the industry.

**TABLE 6.22: THE RELATIONSHIP BETWEEN OVERSIGHT AND CONTROL AND FRM SUCCESS**

Oversight and Control	FRM success
Unauthorised risk taking	0.37*
Change in regulations	0.37*
Reputational risk	0.30*
Reserve recalculation risk	0.26*

Indicates a significant relationship at  $p < 0.05$

Table 6.22 shows that oversight and control is positively related to the successful reduction of FRM risks. These risks included reduction in unnourished risk ( $r=0.37$ ,  $p < 0.05$ ), reduction in change in regulation risk ( $r=0.37$ ,  $p < 0.05$ ), reduction in reputational risk ( $r=0.30$ ,  $p < 0.05$ ), and reduction in reserve recalculation risk ( $r=-0.36$ ,  $p < 0.05$ ). These results support proposition P1 that oversight and control is positively related to FRM success.

#### **6.4 DIFFERENCES BETWEEN UPSTREAM AND DOWNSTREAM EVALUATION OF FRM ISSUES**

The research question in this regard is as follows:

- Do upstream and downstream organisations differ with regard to their evaluation of FRM issues in the petroleum industry in Nigeria?

The issues are taken from the variables in questions 2, 3, 4 and 5. Two-sample t-tests were calculated to answer the abovementioned research question. The reason for this question was to determine whether the envisaged FRM framework should make provision for a differential approach between upstream and downstream organisations when managing financial risks in the Nigerian petroleum industry. The empirical results of this analysis are reported in Table 6.23.

Table 6.23 shows the following results:

- downstream organisations regard exchange rates as a risk significantly more than upstream organisations, with (mean score = 4.35 against 3.71,  $p < 0.05$ );
- downstream organisations regard financial risks as having a significantly more negative influence on the reduction of profits than upstream organisations (mean score = 4.59 against 4.15,  $p < 0.05$ );
- downstream organisations view top management support (mean score= 3.84 against 3.45,  $p < 0.05$ ), risk management culture (mean score= 4.38 against 3.7,  $p < 0.001$ ), communication flow (mean score= 4.28 against 3.58,  $p < 0.01$ ) and information technology (mean score= 4.44 against 3.98,  $p < 0.05$ ) as critical success factors for FRM significantly more than upstream organisations; and
- downstream organisation regard themselves successful in achieving strategic FRM significantly more than upstream organisations (mean = 4.03 against 3.615,  $p < 0.01$ ).

**TABLE 6.23: UPSTREAM AND DOWNSTREAM EVALUATION OF FRM ISSUES**

FRM issue	Code	Up-stream	Down-stream	t-value	df	p-value
Influence of foreign exchange rates	FOREX	3.71	4.35	-2.49	60	0.015*
Influence of price of oil and gas	COMMOD	4.40	4.23	0.73	60	0.469
Interest rate fluctuation	INTEREST	2.98	3.41	-1.79	60	0.077
Oil and gas demand and supply	DEMAND&S	3.67	3.65	0.06	60	0.949
Liquidity and equity risks	LIQUID&EQ	2.91	3.23	-1.02	60	0.311

Profit reduction	PROFIT	4.15	4.59	-2.02	60	0.048*
Cash flow reduction	CASHFLO	3.89	4.12	-1.06	60	0.291
Increased cost of doing business	COSTBUS	4.09	3.94	0.59	60	0.558
Shelving of projects	SHELVING	3.64	3.53	0.42	60	0.673
Cutting of workforce	WORKFOR	3.49	3.94	-1.41	60	0.164
Incompetent staff	CHALLG1	2.44	2.47	-0.07	60	0.940
Insufficient awareness	CHALLG2	2.98	2.70	0.79	60	0.435
Inadequate management support	CHALLG3	2.71	3.00	-0.83	60	0.409
Incorrect perceptions	CHALLG4	2.98	2.94	0.12	60	0.901
Lack of capacity building	CHALLG5	3.02	2.76	0.78	60	0.436
Top management support	TTOPMGT	3.45	3.84	-2.16	60	0.034*
Risk management culture	CCULT	3.77	4.38	-3.97	60	0.000***
Communication flow	CCOMM	3.58	4.28	-3.45	60	0.001**
Information technology support	IITIMPAC	3.98	4.44	-2.62	60	0.011*
FRM success	SSUCCE	3.61	4.03	-3.04	60	0.003**

Note: \*Relationship significant at  $p < 0.05$   
\*\*Relationship significant at  $p < 0.01$   
\*\*\*Relationship significant at  $p < 0.001$

On all the other FRM issues listed in Table 6.23, downstream and upstream organisations did not differ significantly. The abovementioned empirical results indicate that a strategic FRM framework should make provision for a differential approach to FRM in downstream and upstream organisations as far as managing exchange rates is concerned. The results, however, also reveal that an FRM framework should place a stronger focus on strengthening the critical success factors, namely top management support, risk management culture, communication flow and information technology in upstream rather than downstream organisations in the Nigerian petroleum industry. These critical success factors should at least be

maintained (and further strengthened) in downstream organisations, as the latter are already recognising the importance of these critical success factors.

## **6.5 QUALITATIVE RESULTS**

The qualitative data that emerged from the interviews has been reported in the relevant sections above. The results from these interviews generally seem to support the analyses of the quantitative data.

There are, however, certain themes that emerge from the qualitative data which go beyond the scope of the quantitative and qualitative results that are relevant to the present study. These themes are the following:

- inability of government to pay its portion of funding for the joint venture agreements (See Mr A and Mr D, section 6.3.4.7: 182);
- corruption in the fuel subsidy system (see Mr C and Mr D, section 6.3.4.1: 183);
- non-stop beneficiation demands by oil companies' host communities (see Mr D and Mrs E, section 6.3.1.5: 156);
- oil theft and destruction of infrastructure (see Mr D and Mrs E, section 6.3.1.5: 156).
- militant activities in the Niger Delta (see Mr D, section 6.3.1.5: 156); and
- out-of-date rules and regulations (see Mr D, section 6.3.4.1: 182).



While external variables are beyond the control of managers in the Nigerian petroleum organisations, it is important that the managers factor in these variables in their FRM framework for this industry.

## **6.6 CHAPTER SUMMARY**

This chapter answered the six research questions of the study by utilising a number of annalistic measures. The results were illustrated, enumerated, regressed, tested and presented with regard to the critical success factors for the development of a FRM framework in the oil and gas industry of Nigeria. Principally, the study addressed the question of the nature of financial risks facing this industry. It also examined the negative impact of financial risks, and the challenges faced by the industry in the implementation their FRM systems, as well as the critical success factors in the FRM system and how risks factors were perceived by downstream companies and upstream companies. In the next chapter, the study summarises its findings, conclusions, and recommendations.

## **CHAPTER 7**

### **FINDINGS, CONCLUSIONS AND RECOMMENDATIONS**

#### **7.1 INTRODUCTION**

In the final chapter of this thesis, the findings, conclusions and recommendations of the study are discussed. The chapter begins with an overview and discussion of the main empirical results as they were presented in response to the research questions formulated in this study. This overview and discussion culminate in a proposed framework of important issues pertaining to FRM which managers in the Nigerian petroleum industry need to pay attention to if successful FRM is to be attained in the industry. The chapter also reports on the limitations of this study and then proceeds to provide recommendations for future research.

#### **7.2 DISCUSSION OF THE EMPIRICAL FINDINGS**

The present study pursued the following research questions:

- 1) What are the financial risk factors in the oil and gas industry of Nigeria?
- 2) What is the impact of financial risks on oil and gas organisations in Nigeria?
- 3) What are the challenges in FRM that oil and gas organisations encounter in Nigeria?
- 4) What are the critical factors needed for the success of FRM in the oil and gas industry in Nigeria?

- 5) Do upstream and downstream organisations differ with regard to their evaluation of FRM issues in the petroleum industry in Nigeria?
- 6) What would be an effective strategic FRM framework for oil and gas organisations in Nigeria?

The results as they pertain to the abovementioned research questions are now summarised and discussed in terms of the implications they have for successful FRM.

### **7.2.1 What are the main financial risk factors in the oil and gas industry of Nigeria?**

The empirical results in Table 6.6 revealed that the three most important financial risk factors associated with the Nigerian petroleum industry are:

- oil and gas price fluctuations (95%);
- Naira/dollar exchange rates fluctuations (82%); and
- demand and supply of petroleum products fluctuations (74%).

These findings are consistent with BDO's (2016: 2) oil and gas risk factor report which found that "price volatility is the most reported risk in 10-K filings (securities and exchange commission) of the 100 largest publicly traded U.S. oil and gas exploration and production (E&P) companies". This was followed by supply concerns as the second most frequently reported financial risk, because more companies are entering into the shale oil and gas production business in the US, which used to be one of

Nigeria's top importers of oil and gas. These outcomes also align with the study by Enyinda et al. (2011: 38) which found that the petroleum industry was prone to various risks including price, costs, currency/interest rate instability, and government action, which could impact on companies' financial performance and competitiveness.

It is important for managers in the Nigerian petroleum industry to pay attention to the abovementioned financial risk factors, as they disrupt the sustainability of the industry if not properly managed. In other words, the long-term prospects of the industry will be at stake if these risks are not effectively managed. Specifically, it could result in increased production costs, less return on investment, less cash flow, inability to increase reserves, and inability to service accumulated debts with the probability of financial distress costs associated with bankruptcy.

The Pearson correlations (Table 6.9) however revealed that none of the financial risks investigated in this study, including the three identified above, was significantly correlated with FRM success. This means that the respondents of this study did not believe that the abovementioned financial risks played a significant role in achieving successful FRM in the industry. In other words, they did not believe that knowing the importance of these risks for industry would lead to the development of a strategic FRM policy framework, proper identification and analysis of financial risks, effective mitigation of financial risks, or to proper communication and control of financial risks in the industry. This does not augur well for successful FRM in this industry.

From the review of the empirical findings, it could be concluded that managers in the Nigerian petroleum industry are aware of the identified risks to the industry, but they do not seem to realise that a framework of policy development risk analysis, risk mitigation, and risk communication and control should be conducted in organisations to successfully manage financial risk in the industry.

Against this background, it is recommended that managers develop a framework in their companies for continuous monitoring, analysing, communicating, mitigating and controlling the abovementioned risks in their companies. To this end, managers should develop ways to quantify and flag these risks (in simple numbers and indices) and at the same time, indicate their mitigation strategies of dealing with these risks. It is important to know what each manager's role is in these mitigation strategies.

### **7.2.2 What is the impact of financial risks on oil and gas organisations in Nigeria?**

The present study investigated the following two sub-questions under this research question:

- 1) How do managers rate the effects of identified financial risks on their companies?
- 2) How are their organisations currently affected by profit reduction, cash flow reduction, increased cost of doing business, shelving of projects and workforce reduction?

The empirical results in Table 6.9 showed that the respondents in this study believed that the following financial risks exert the strongest influence on their companies on these three performance variables:

- oil and gas prices (mean score=4.24);
- exchange rates (mean score=3.86); and
- demand and supply for oil and gas risks (mean score=3.61).

The empirical results (Table 6.10) supported the respondents' assertion that the abovementioned three financial risks exert the strongest influence on their companies. Table 6.10 revealed that high levels of oil and gas prices, exchange rates, and demand and supply risks are associated with higher reduction in profits and cash flow and increased costs of doing business at a  $p < 0.05$ .

Table 6.10 also revealed that:

- high levels of interest rate, liquidity and equity risks are associated with higher levels of cash flow reduction and increased costs of doing business.

The empirical results in this table showed that none of the identified financial risks was significantly related to negative business processes such as shelving of projects and cutting of the workforce.

These findings support the general trend of the situation in the Nigerian petroleum industry as shown in section 6.3.2 and 6.3.3 in that

- prolonged low prices of petroleum products have adversely impacted on the financial wellbeing of companies in the industry;
- the depreciating Naira against major currencies has adversely affected the cost of importation of equipment and petroleum products, thereby reducing profitability and sustainability in the industry; and
- low demand and the oversupply of petroleum products have seriously reduced the ability of companies to meet profit targets, cash flow requirements, and retention of their skilled workforce.

The empirical results of the present study also support the findings of the following previous studies in the petroleum industry:

- Hammoudeh and Li (2005) who found a significant positive relationship between oil price sensitivity and oil industry equity;
- Crum et al.( 2005: 472) who concluded that financial risk factors that affected the value of the organisations arose from the macro-economic environment in terms of issues such as exchange rates, interest rates, commodity prices and competitors' response to issues on a long term;
- BDO (2016: 1–8) whose review of organisation annual reports indicated that these identified financial risks impacted on the financial feasibility of various oil and gas companies in various ways in the US;

- Nigeria, Eni, Shell, Mobil, Total and Chevron who have made similar statements about the effect of these identified financial risks in their annual reports of 2012–2014;
- Rigzone (2014: 1) who found that price fluctuation as a result of oversupply and low world demand for oil and gas was seriously putting pressure on the profitability;
- Gates (2006: 82) and Boyer & Fillion (2007: 433) who reported that falling oil prices put pressure on profit margins; and
- Bartram et al. (2010: 148) who found that foreign exchange risks mostly affected businesses in the oil and gas sector which traded internationally, as this kind of risk disturbs cash flows, sales and competitive positions of these organisations.

The empirical results of the present study, strongly supported by the evidence of previous studies, indicate that managers in the Nigerian petroleum industry must pay serious attention to the managing of the financial risks identified in this study, especially oil and gas price, exchange rate, and demand and supply risks. The empirical results in section 7.2.1 revealed that managers might not sufficiently recognise the need for a framework for quantifying, monitoring, mitigating, communicating and controlling these risks in their organisations.

The empirical results discussed in section 7.2.2 provide an indication of which business processes should be quantified in efforts to assist managers with the proposed framework of monitoring, mitigating, communicating and controlling of the



financial risks. It is recommended that managers in the Nigerian petroleum industry develop simple graphs and indices on oil and gas prices, exchange rates, and demand and supply numbers, and alongside these, keep track of profit and cash flow movements. It is further recommended that the same is done for interest rate, liquidity and equity numbers juxtaposed against cash flow movements and costs of doing business.

### **7.2.3 What are the challenges in FRM that oil and gas organisations encounter in Nigeria?**

The empirical results (Table 6.11) showed that the three most important challenges in FRM that oil and gas organisations face in Nigeria are lack of capacity building (mean score=3.01), incorrect perceptions about FRM (mean score=2.94) and insufficient awareness (mean score=2.87). Although these mean scores do not reflect high levels of agreement with these statements on a five-point scale, they still reveal what the challenges are that Nigerian managers face in managing financial risks.

The empirical results (Table 6.12) further revealed that none of the challenges investigated in this study correlate with FRM success. This means that Nigerian managers in the petroleum industry seem not to see a relationship between having these challenges in organisations and achieving successful FRM in their organisations. It appears that they do not believe that lack of capacity building, incorrect perceptions about FRM and insufficient FRM awareness exert an influence on FRM success in their organisations.

This study results showed that the challenges facing the petroleum industry are similar to those faced by the Nigerian banking industry as mentioned in the CBN (2012: 2) analysis of the banks, namely a lack of skilled risk personnel and a lack of effective risk perception. Also, the findings correspond with those of Zuofa and Ochieng (2014: 371-372) which showed several challenges to project risk management in the oil and gas industry of Nigeria, namely unfamiliarity with fundamental risk management principles, lack of integrations for effectiveness, incompetent staff, absences of risk management culture, and lack of frequent training.

These findings appear to be congruent with the findings reported in sections 7.2.1 and 7.2.2. The fact that these managers do not see a link between the effects of financial risks on their companies and the successful management of financial risks, support the finding above that lack of capacity building, incorrect perceptions about FRM and insufficient FRM awareness is evident in Nigerian petroleum organisations. It is therefore recommended that extensive capacity building programmes in FRM be instituted in these organisations. Capacity building should therefore be an important component of a FRM framework for Nigerian petroleum organisations.

#### **7.2.4 What are the critical factors needed for the success of FRM in the oil and gas industry in Nigeria?**

The present study investigated top management support, communication flow, risk management culture and information technology as critical factors for FRM success in

the Nigerian petroleum industry. For this investigation, a multiple regression analysis was conducted.

The study also investigated organisational structure and training and development as critical factors for FRM success in the Nigerian petroleum industry. For this investigation, Pearson correlations were calculated.

#### 7.2.4.1 Top management support

The empirical results (Table 6.16) showed that top management support was significantly positively ( $r=0.35$ ,  $p < 0.01$ ) related to FRM success. This means that the more top management support is provided in the following areas, the more successful FRM would be in their organisations, in terms of:

- development of policy framework;
- identification of financial risks;
- analysis of FRM;
- mitigation of financial risks;
- communication and control; and
- responsibility for oversight and control.

These findings differ from previous studies on critical success factors such as those of Young and Jordan, (2008: 8) and Yaraghi & Langhe (2011: 559) who end their research on the importance of these critical success factors without demarcating the areas of risk management that top management support could improve.

Against this background, it is recommended that the top managers in Nigerian petroleum companies are made aware of this responsibility, and that wherever lack of capacity exists, training in this regard should be sought and provided.

#### 7.2.4.2 Communication flow

The empirical results (Table 6.16) also indicated that communication flow was positively related ( $r=0.26$ ,  $p < 0.05$ ) to FRM success. This means that organisational communication needs to facilitate the following, as far as the managing of financial risks is concerned, to achieve more FRM:

- timely identification of risks;
- policy dissemination with regard to risk management;
- decision-making with regard to risk management; and
- control measures with regard to risk management.

The study findings highlight the importance of communication in FRM systems and also differ from previous findings such as those of Speculand (2007: 5) and Zhao et al. (2013: 1199) by stressing the areas of FRM where communication is of importance as stated above.

It is therefore recommended that managers of Nigerian petroleum companies be made aware of the ways in which organisational communication should facilitate the management of financial risks in their companies. This has implications for

organisational design, infrastructure and technology in these organisations. It is also recommended that training and education be sought to develop skills and competencies in organisation communication to achieve FRM success.

#### 7.2.4.3 Financial risk culture

The empirical results (Table 6.16) showed ( $r=0.02$ ,  $p > 0.05$ ) that FRM culture was not significantly related to FRM success. In other words, an FRM culture that enables the following does not influence FRM success:

- the achievement of strategic FRM objectives;
- improved decision making with regard to FRM matters;
- increased participation and collaboration on FRM matters; and
- achieving greater FRM awareness.

However, the study results show that FRM culture is an important critical success factor in support of the literature (Hillson & Murray-Webster, 2004: 1; Speculand, 2007: 5).

This finding again supports the notion that a lack of understanding about FRM exists among the respondents of this study. It appears that the respondents do not see the necessity for a favourable FRM culture. These findings provide strong support for the need to develop an FRM framework for the Nigerian petroleum industry.

#### 7.2.4.4 Information technology

The empirical results (Table 6.16) indicated ( $r=0.19$ ,  $p > 0.05$ ) that information technology was not significantly related to FRM success. In other words, these results show that the extent to which information technology assists in the following aspects of FRM does not lead to FRM success:

- corporate governance;
- environmental scanning;
- risk ranking and analysis; and
- risk mitigation and control.

Previous studies show that FRM information technology is an important critical success factor for the achievement of FRM success (CIMA, 2007: 23; Landsberg, 2011: 7–8). IT support in the present study however does not seem to be linked to FRM success. This result is understandable, given the fact that the creation of a beneficial FRM culture is not seen as a determinant of FRM success. Infrastructure, which includes technology, should support a favourable FRM culture, but as this is not sufficiently recognised as a determinant of FRM success, Nigerian managers in the petroleum industry also do not seem to recognise the importance of information technology in achieving FRM success.

Against this background, it is recommended that awareness of the critical success factors for FRM in the Nigerian petroleum industry is aggressively created. This

awareness will grow to include the use of information technology to achieve FRM success in these organisations.

#### 7.2.4.5 Organisational structure

Table 6.17 of the empirical results revealed that most respondents reported the use of a hierarchical FRM organisational structure, followed by a centralised, matrix and flat structure. Table 6.18 of the empirical results revealed that only the matrix structure was significantly related to FRM success. This means that the more the matrix organisational structure is in use, the more FRM success will be achieved. It is therefore recommended that the matrix structure be used in the pursuit of FRM success in Nigerian petroleum companies. Matrix organisational structures also strengthen the effective use of resources, advances motivation and commitment, and increase information flow for effectiveness and sustainability of organisational process (Ryyananen & Salminen, 2014: 705).

#### 7.2.4.6 Training and development

The empirical results in Table 6.19 revealed that most respondents had FRM training and development annually in their organisations. This was followed by a frequency of more than twice per annum, and then twice per annum. A small minority of respondents reported that FRM training and development was never provided in their companies.

On the other hand, the empirical results (Table 6.20) revealed that training and development of more than twice per annum was significantly positively ( $r=0.32$ ,  $p < 0.05$ ) related to FRM success. This means that FRM training and development should occur more often than twice per annum in an organisation to achieve FRM success. The empirical results (Table 6.20) also revealed that having no training and development was significantly negatively ( $r=-0.36$ ,  $p < 0.05$ ) related to FRM success. That means that if FRM training and development never occurs in organisations, FRM success would not be achieved. It is therefore recommended that FRM training and development take place more than once per year in order to achieve FRM success in Nigerian petroleum companies. This finding provides further support for the importance of developing an FRM framework for these companies within which this training and development could take place.

#### 7.2. 4.7 Oversight and control

The empirical results in Table 6.21 revealed that most respondents perceived that FRM oversight and control operationalisation can reduce regulation change risk. This was followed by reduction of unauthorised risk-taking, reduction of reputational risk and lastly reduction reserve recalculation.

Also, the empirical results (Table 6.22) reveal the following: oversight and control significantly positively related ( $r=0.37$ ,  $p < 0.05$ ) to FRM success in reducing unauthorised risk; significantly positively related ( $r=-0.37$ ,  $p < 0.05$ ) to FRM success in reducing change in regulation risk; significantly positively related ( $r=-0.30$ ,  $p < 0.05$ )



related to FRM success in reduction of reputational risk; and finally, was significantly positively related ( $r=-0.26$ ,  $p < 0.05$ ) to FRM success in reducing reserve recalculation risk.

This means that FRM oversight and control, if practised consistently, should reduce risk in organisations. It is therefore recommended that FRM oversight and control be effectively applied for successful FRM in Nigerian petroleum companies. This finding provides further support for the importance of oversight and control in the FRM framework for these companies within Nigeria.

#### **7.2.5 Do upstream and downstream organisations differ with regard to their evaluation of FRM issues in the petroleum industry in Nigeria?**

The abovementioned research question was investigated to determine whether the envisaged FRM framework should make provision for a differential approach between upstream and downstream organisations when managing financial risks in the Nigerian petroleum industry. The empirical results (Table 6.23) revealed that:

- downstream organisations regard exchange rates as a risk significantly more than upstream organisations, with (mean score = 4.35 against 3.71,  $p < 0.05$ );
- downstream organisations regard financial risks as having a significantly more negative influence on the reduction of profits than upstream organisations (mean score = 4.59 against 4.15,  $p < 0.05$ );
- downstream organisations view top management support (mean score= 3.84 against 3.45,  $p < 0.05$ ), risk management culture (mean score= 4.38 against

- 3.7,  $p < 0.001$ ), communication flow (mean score= 4.28 against 3.58,  $p < 0.01$ ) and information technology (mean score= 4.44 against 3.98,  $p < 0.05$ ) as critical success factors for FRM significantly more than upstream organisations; and
- downstream organisation regard themselves successful in achieving strategic FRM significantly more than upstream organisations (mean = 4.03 against 3.615,  $p < 0.01$ ).

#### 7.2.5.1 Differentiation with regard to exchange rates

The empirical results (Table 6.23) revealed that downstream organisations regarded exchange rates as having a significantly stronger influence on their operations than did upstream organisations. This means that downstream organisations, in other words wholesalers and retailers of petroleum, should place a stronger emphasis on managing exchange rates as a financial risk.

#### 7.2.5.2 Differentiation with regard to financial risks having an influence on profits

The empirical results (Table 6.23) revealed that downstream organisations regarded financial risks as having a significantly more negative influence on their profits than did upstream organisations. This means that wholesalers and retailers of petroleum should place a stronger emphasis on monitoring and mitigating against risks of oil and gas price, exchange rate, and demand and supply, as these (see section 5.2.2) were particularly associated with greater reduction of profits.

### 7.2.5.3 Differentiation with regard top management support, risk management culture, communication flow and information technology

The empirical results (Table 6.23) showed that downstream organisations (wholesalers and retailers), placed a significantly stronger focus on strengthening critical success factors, such as top management support, risk management culture, communication flow and information technology than did downstream organisations. This is an indication that managing financial risks is more important for wholesalers and retailers than for producers.

### 7.2.5.4 Differentiation with regard to success in achieving strategic FRM

Despite the empirical results (Table 6.23) indicating that downstream organisations are perceived to be more negatively affected by financial risks than are upstream organisations, downstream organisations regarded themselves as more successful in achieving strategic FRM than their upstream counterparts. This means that downstream forms believe themselves to more effective in:

- developing of FRM policy frameworks;
- analysing financial risks;
- mitigating financial risks; and
- communicating and controlling of financial risks.

This result might be an indication that an FRM framework is more necessary for upstream organisations than it is for those downstream. The development of such a framework could therefore make a more important contribution to the sustainability and growth upstream organisations of the Nigerian petroleum industry.

#### 7.2.5.5 Non-differentiating characteristics

The empirical results show that there were no perceived significant differences between upstream and downstream organisations with regard to the following industry characteristics:

- influence of price of oil and gas on the industry;
- influence of interest rate fluctuation on the industry;
- influence of oil and gas demand and supply on the industry;
- influence of liquidity and equity risks on the industry;
- financial risks causing cash flow reductions;
- financial risks causing increased cost of doing business;
- financial risks causing shelving of projects;
- financial risks causing cutting of workforce; and
- companies being challenged by incompetent FRM staff, insufficient FRM awareness, inadequate management support for FRM operations, incorrect perceptions about FRM, and lack of FRM capacity building.

This finding implies that an FRM framework for the Nigerian petroleum industry must provide for differentiation only as far as the findings reported in sections 7.2.5.1 to 7.2.5.4 are concerned, and not for all industry characteristics.

### **7.2.6 What would be an effective strategic FRM framework for oil and gas organisations in Nigeria?**

The main purpose of this study was to develop an effective strategic FRM framework for oil and gas organisations in Nigeria. Six research questions (see section 7.2 above) were formulated and investigated to develop such a framework. Data was collected from a sample of 70 top, middle, and lower level managers in the Nigerian petroleum industry. Five experts in this industry were also interviewed to collect qualitative data on the subject. Various statistical procedures including multiple regression analyses, Pearson correlations, two-sample t-tests and descriptive statistics were performed to analyse the data in search of answers to the research questions. The answers to these research questions are now used to populate Table 7.1 and thereby answered the six research question and fulfilled the primary objective of this study.

**TABLE 7.1: PROPOSED FRM FRAMEWORK FOR THE NIGERIAN PETROLEUM INDUSTRY**

NO.	FRM ISSUE	ACTION REQUIRED BY FIRM
1	<p>The three main financial risks that impact my organisation mostly, are:</p> <ul style="list-style-type: none"> <li>• Fluctuations in the petroleum price</li> <li>• Fluctuations in exchange rates</li> <li>• Fluctuations in demand and supply of petroleum</li> </ul>	<ul style="list-style-type: none"> <li>• Scan environment regularly for changes/ developments as far as these risks are concerned (indices, governmental reports, industry reports, etc.)</li> <li>• Develop a framework of continuous monitoring, analysing, communicating, mitigating and controlling the identified risks in companies.</li> <li>• Develop ways to quantify and flag risks (in simple numbers and indices) and indicate mitigation strategies to deal with these risks.</li> <li>• Downstream organisations must be more alert to fluctuations in exchange rates.</li> </ul>
2	<p>The abovementioned risks mostly affect these three performance variables of my organisation:</p> <ul style="list-style-type: none"> <li>• Profits</li> <li>• Cash flow</li> <li>• Cost of doing business</li> </ul>	<ul style="list-style-type: none"> <li>• Develop simple graphs and indices on oil and gas prices, exchange rates, and demand and supply numbers.</li> <li>• Juxtapose the above against their concomitant profit and cash flow movements.</li> <li>• Downstream organisations must be more alert to financial risk impacts on their profits.</li> <li>• Develop graphs and indices for interest rate, liquidity and equity numbers.</li> <li>• Juxtaposed the above against cash flow movements and costs of doing business.</li> <li>• Provide for early warning techniques that would indicate that these impacts are occurring and the extent of these impacts.</li> </ul>

3	<p>The most important FRM challenges companies face are:</p> <ul style="list-style-type: none"> <li>• lack of capacity building</li> <li>• incorrect perceptions about FRM</li> <li>• insufficient awareness of FRM operations</li> </ul>	<ul style="list-style-type: none"> <li>• Institute extensive capacity building programmes in FRM in organisations.</li> <li>• Institute extensive awareness creation programmes on FRM in organisations.</li> </ul>
4	<p>Critical factors to achieve FRM success are:</p> <ul style="list-style-type: none"> <li>• Top management support</li> <li>• Communication flow</li> <li>• Matrix organisational structure</li> <li>• Frequency of FRM training and development</li> <li>• Oversight and control</li> </ul>	<ul style="list-style-type: none"> <li>• Monitor and continuously improve top management support for FRM activities.</li> <li>• Monitor and continuously improve top management's dedication to FRM success</li> <li>• Monitor and continuously improve top management's involvement in the formulation of FRM policies.</li> <li>• Monitor and continuously improve top management's provision of funding for FRM operations.</li> <li>• Monitor and continuously improve top management's taking responsibility for FRM evaluation and control.</li> <li>• Monitor and continuously improve how organisational communication flow facilitates timely risk identification.</li> <li>• Monitor and continuously improve how organisational communication flow facilitates FRM policy dissemination.</li> <li>• Monitor and continuously improve how organisational communication flow facilitates FRM decision making.</li> <li>• Monitor and continuously improve how organisational communication flow facilitates FRM control measures.</li> </ul>

		<ul style="list-style-type: none"> <li>• Monitor and continually improve organisational structure</li> <li>• Upstream organisations must monitor and continuously improve the above-mentioned much stronger than downstream organisations.</li> <li>• Implement a matrix organisational structure to manage FRM operations.</li> <li>• Ensure that FRM staff members go for training more than twice per annum.</li> </ul>
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### 7.3 QUALITATIVE FINDINGS

The qualitative findings that emerged from this study generally supported the empirical findings that emerged from the quantitative data analyses. This fact attests to the validity and reliability of the collected data in this study.

Interviewees did, however, highlight other issues not covered in the survey of the present study which they believed threatened the FRM process in the petroleum industry of Nigeria. These issues include:

- Inability of government to pay its portion of funding for the joint venture agreements;
- Corruption in the fuel subsidy system;
- Non-stop beneficiation demands by oil companies' host communities;
- Oil theft and destruction of infrastructure;
- Militant activities in the Niger Delta; and



- Outdated rules and regulations.

Although beyond their control, these findings highlighted the issues that oil companies needed to plan for, in order to effectively mitigate financial risks arising from these issues. It is recommended that managers of Nigerian petroleum companies continuously monitor the abovementioned qualitative issues, formulate plans (policies, rules and regulations), develop intra-organisational infrastructure, and design internal controls that would protect their companies against these external threats.

#### **7.4 LIMITATIONS OF THE STUDY AND FUTURE RESEARCH AREAS**

Despite great effort which went into the study, certain shortcomings with regard to methodology need to be reported. These shortcomings relate to survey methods, sampling and interviewees' biases. Access to the sample respondents and interviewing experts was challenged in some cases, by the refusal of some respondents to return the survey instruments, and by managers refusing to take part in the interviews. A number of appointment cancellations prolonged the data collection period. In addition, gaining access to companies in the Nigerian petroleum industry was a cumbersome process which might or might not have been related to militant activities in the industry. There were also risks associated with host community relationships which made it very difficult for respondents and interviewees to discuss communities' clashes, infrastructure vandalism and oil theft. After a huge effort, including two visits to Nigeria, a sample of only 70 respondents could be gathered and interviews with five industry experts could be conducted.

An important factor that impacted on the results of the study was that a change of supervisors introduced changes of supervisory styles and preferences. When a new set of supervisors was introduced midway through the study, they had to work with a questionnaire and subsequent collected data which had already been drawn up by previous supervisors. As a result of these challenges, the construction of the best possible measuring instruments to collect the data may have suffered. Despite these challenges however, very valuable data was collected and important managerial insights emerged from this study.

In light of these limitations, areas for future research or improvement include:

- the interviewing of more experts in the petroleum industry;
- the collecting of data from a bigger sample;
- the identification of more critical success factors for FRM in the Nigerian petroleum industry; and
- the construction of improved instruments to collect data about critical success factors.

## **7.5 CONTRIBUTION OF THIS STUDY**

Petroleum companies are critical to the Nigerian economy, as the petroleum sector is the biggest earner and spender of foreign exchange and the highest employer of labour. The industry is however faced with challenges of unprecedented fluctuation of commodity prices, exchange rates, a series of divestments, host communities'

demands, oil theft, project shelving, and destruction of infrastructure. Workforce cutting and consolidations are also the order of the day and current risk management systems in companies appear not to be working.

FRM systems in Nigerian petroleum companies have failed because risk managers did not have one generally accepted framework to manage these risks. There was a need for an integrated framework that is more descriptive and that does not rely only on mathematical models, separate management of each financial risk, and specific focus on the downside risk and derivatives.

Mathematical models have presented weaknesses in the identification of issues, dissemination of information, policy formulation, planning, the institution of risk culture or delimitation of authority and in responsibility through the organisational structure. Mathematical models could not fully reduce the identification, communication, structure, and environmental scanning of FRM to mathematical models.

The present study was the first attempt at an FRM system that integrated all the financial risks strategically and took into consideration all the critical success factors that can solve the problems and challenges facing the Nigerian petroleum companies in the long term. The present study succeeded in developing a framework (see Table 7.1) that:

- provides a thorough understanding and proper evaluation of the most important financial risks petroleum companies face;

- identifies the type and extent of top management support needed in a strategic FRM system;
- identifies and operationalises the financial risk culture that should be fostered to achieve FRM success;
- identifies the organisational structure that supports the successful achievement of FRM;
- identifies and operationalises the organisation communication flow that supports the successful achievement of FRM; and
- specifies the amount of training that supports the successful achievement of FRM.

## **7.6 CONCLUSION**

The future of the petroleum industry in Nigeria is dependent on the ability of the companies in the sector to manage financial risks. An effective financial risk management is particularly important in the wake of the slump in oil prices, the depreciating Naira and concern regarding oversupply issues in the industry that were exerting pressure on the finances of the companies.

The FRM framework developed in this study provides an important strategic management tool. If implemented correctly, this framework will in an integrated manner, monitor and mitigate financial risks in the Nigerian petroleum industry through indices and graphs focussed on the most important risks in this industry. It will also

monitor and deal with business processes affected by these risks, and will action critical success factors that would make the process of FRM more effective.

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## **ANNEXURE A: THE QUESTIONNAIRE**

### **DOCTOR OF BUSINESS ADMINISTRATION THESIS QUESTIONNAIRE**



Dear Participant:

My name is Christina Ogulu. I am a graduate student at Nelson Mandela Metropolitan University Business School. For my doctoral thesis I am examining financial risks and how they are managed in the petroleum sector in Nigeria.

Because you represent or work for one of the companies in the Nigerian petroleum sector, I am inviting you to participate in this research study by completing the attached survey. The following questionnaire will require approximately 10 minutes to complete. There is no compensation for responding nor is there any known risk. In order to ensure that all information will remain confidential, please do not include your name. Copies of the project will be submitted to my NMMU instructor and to the Research Director at the Business School.

If you choose to participate in this project, please answer all questions as honestly as possible and return the completed questionnaire promptly to this address ([coguluus@gmail.com](mailto:coguluus@gmail.com)).

It is important to state that participation is strictly voluntary and you may refuse to participate at any time.

Thank you in advance for taking the time to assist me in my educational endeavors. The data collected will provide useful knowledge about financial risks and how they are managed in the Nigerian petroleum industry. If you would like a summary copy of this study you can contact NMMU at the following address [business.school@nmmu.ac.za](mailto:business.school@nmmu.ac.za) .

Completing and returning the questionnaire is indication of your willingness to participate in this study. If you require additional information or have questions, please contact me at ([coguluus@gmail.com](mailto:coguluus@gmail.com)). If however you are not satisfied with the manner in which this study is being conducted, you may report any complaints to the Research Department at NMMU Business School ([business.school@nmmu.ac.za](mailto:business.school@nmmu.ac.za))

Once again, thank you for your time.

PERSONAL INFORMATION

Sex: Female  Male

Age: \_\_\_\_\_

Occupation: \_\_\_\_\_

Position: Top Management , Middle Management , Lower Management

Petroleum Sector: Upstream , Downstream , Both

SECTION A

1. In your opinion what are the common financial risks faced by companies in the Nigerian petroleum industry (please tick from the list below)

- Naira/Dollar exchange fluctuation
- Oil and gas price fluctuation
- Interest rate fluctuation
- Demand and supply of petroleum products
- Liquidity risk
- Equity risk
- Cost risk

2. How would you rate the effects of the different risks on your organisation?

1 = Very low, 2 = Low, 3 = Average, 4 = High, 5 = Very high

- a) Fluctuations in the exchange of the Naira
- b) Fluctuation in price of oil and gas
- c) Interest rate fluctuation
- d) Oil and gas demand and supply
- e) Liquidity and equity risks

3. In your opinion how do the following impacts of financial risk affect your organisation?

1=Very low, 2=Low, 3=Average, 4= High, 5=Very high

- a) Profit reduction
- b) Cash flow reduction
- c) Increased cost of doing business
- d) Shelving of projects
- e) Cutting of workforce

4. My organisation's method of financial risk management is very successful

1 =Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree and 5 = Strongly Agree

- a) Development of policy framework
- b) Identification of financial risks
- c) Analysis of FRM
- d) Mitigation of financial risks
- e) Communication and control

5. My organisation faces the following challenges in managing financial risks  
 1 =Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree and 5 = Strongly Agree

- a) Incompetent staff
- b) Insufficient awareness
- c) Inadequate management support
- d) Wrong perception
- e) Lack of capacity building

6. My organisation has adopted the following measures to enhance financial risk management  
 1 =Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree and 5 = Strongly Agree

- a) Training
- b) Risk awareness culture
- c) Centralised and decentralised structure
- d) Adequate communication
- e) Use of technology

**SECTION B: Developing a successful financial risk management system for your organisation**

7. How would you rate your **top management** support for the FRM process in the following areas? 1=Very low, 2=Low, 3=Average, 4=High, 5=Very high

- a) Formulation of FRM policy
- b) Dedication to achievement
- c) Provision of sufficient funding
- d) Responsibility for oversight and control

8. State your degree of agreement if an **FRM framework** should contain these stages

1 =Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree and 5 = Strongly Agree

- a) Identification of risk
- b) Risk analysis
- c) Risk mitigation
- d) Risk control

9. My organisation's **financial risk culture** has enabled us to achieve the following:  
 1 =Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree and 5 = Strongly Agree

- a) Strategic objectives
- b) Improved decision making
- c) Increased participation and collaboration
- d) Greater awareness

10. In your opinion, what kind of **FRM organisation structure** is in operation in your establishment?

1 =Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree and 5 = Strongly Agree

- a) Flat structure
- b) Hierarchical structure
- c) Matrix structure
- d) Centralised structure

11. My organisation's **communication flow** has aided the FRM system in ...

1 =Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree and 5 = Strongly Agree

- a) Timely identification
- b) Policies dissemination
- c) Decision making
- d) Control measures

12. My organisation organises **training and development** to improve FRM as often as ...

1 =Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree and 5 = Strongly Agree

- a) Once a year
- b) Twice a year
- c) More than twice
- d) Never

13. In my opinion **information technology** has been of immense help in the following areas:

1 =Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree and 5 = Strongly Agree

- a) Corporate governance
- b) Environment scanning
- c) Risk ranking and analysis
- d) Risk mitigation and control

14. In my opinion **oversight and control** have saved my organisation from the following risks

1 =Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree and 5 = Strongly Agree

- a) Unauthorised risk taking
- b) Change in regulations
- c) Reputational risk
- d) Reserve recalculation risk

15 How would you rate the importance of these FRM sustainable characteristics in a framework?

1=Very unimportant, 2= Unimportant, 3= Neutral, 4= Important, 5= Very important

- a) Top management leadership
- b) Organisation structure
- c) FRM Culture
- d) Communication
- e) Information technology
- f) Training and reinforcement

16. How would you rate the importance of these stages in an FRM framework improvement?

1=Very unimportant, 2= Unimportant, 3= Neutral, 4= Important, 5= Very important

- a) Review of existing policies
- b) SWOT analysis
- c) Policy and objective setting
- d) Identification
- e) Categorisation
- f) Analysis
- g) Option Plan
- h) Mitigation
- i) Review
- j) Continuous communication

## **ANNEXURE B: INTERVIEW PROTOCOL**

### **DOCTOR OF BUSINESS ADMINISTRATION THESIS INTERVIEW**



Dear Participant:

My name is Christina Ogulu. I am a graduate student at Nelson Mandela Metropolitan University (NMMU) Business School. For my doctoral thesis I am examining financial risks and how they are managed in the petroleum sector in Nigeria.

Because you represent or work for one of the companies in the Nigerian petroleum sector, I am inviting you to participate in this research study by attending an interview. The following interview questions will require approximately 30 minutes. There is no compensation for responding nor is there any known risk. In order to ensure that all information will remain confidential, please do not include your name. Copies of the project will be provided to my NMMU instructor and to the Research Director at the Business School.

If you choose to participate in this project, please answer all the questions as honestly as you possibly can and do note that the interview will be tape-recorded for transcription purposes only.

Participation is strictly voluntary and you may refuse to participate at any time.

Thank you in advance for taking the time to assist me in my educational endeavors. The data collected will provide useful knowledge about financial risks and how they are managed in the Nigerian petroleum industry. If you would like a summary copy of this study you can contact NMMU at the following address [business.school@nmmu.ac.za](mailto:business.school@nmmu.ac.za) .

By taking part in the interview session you indicate your willingness to participate in this study. If you require additional information or have questions, please contact me at ([coguluus@gmail.com](mailto:coguluus@gmail.com)). If you are not satisfied with the manner in which this study is being conducted, you may report any complaints to the Research Department at the NMMU Business School via the following email: ([business.school@nmmu.ac.za](mailto:business.school@nmmu.ac.za) )

Once again, thank you for your time.

## Interview Protocol

### PERSONAL INFORMATION

Sex: Female  Male  Age: \_\_\_\_\_

Occupation: \_\_\_\_\_

Position/Level: Top Management , Middle Management , Junior Management

Petroleum sector: Upstream , Downstream , Both

### SECTION A

7. In your opinion what are the common financial risks faced by companies in the Nigerian petroleum industry?
8. How would you describe the effects of the different risks on your organisation?
9. In your opinion how do the effects of financial risks impact on or affect your organisation
10. In what specific areas would you say your organisation's method of financial risk management is very successful? organisation
11. What are the challenges your organisation faces in managing financial risks?
12. What are the measures adopted by your organisation to enhance financial risk management?

### SECTION B: Developing a successful financial risk management structure for your organisation

13. How would you describe the areas of the financial risk management process that your top **management has shown considerable leadership and support**?
14. In your view what are the stages of **FRM framework** that are in operation in your establishment?
15. How has your organisation's **financial risk culture** enabled you to achieve its FRM process?
16. In your opinion, what kind of **FRM organisation structure** is in operation in your establishment?
17. In what areas has your organisation's **communication flow** aided the FRM system in those areas?

18. Does your organisation often organise **training and development** to improve FRM?
19. In what areas by your opinion has **information technology** been of immense help to the FRM system?
20. What financial risks in your opinion have **oversight and control** saved your organisation?
21. In your opinion what are the critical success factor for a FRM framework?
22. Please identify what stages in your opinion that an FRM system should contain?



# ANNEXURE C: ETHICS CLEARANCE – FORM E



FORM E

## ETHICS CLEARANCE FOR TREATISES/DISSERTATIONS/THESES

*Please type or complete in black ink*

**FACULTY:** Business and Economic Sciences \_\_\_\_\_

**SCHOOL/DEPARTMENT:** Business School \_\_\_\_\_

I, (surname and initials of supervisor) **Arnolds, C.A.** \_\_\_\_\_

the co-supervisor for (surname and initials of candidate) **Ogulu, C.** \_\_\_\_\_

\_\_\_\_\_ (student number) **210268069** \_\_\_\_\_

a candidate for the degree of **Doctor in Business Administration (DBA)** \_\_\_\_\_

with a treatise/dissertation/thesis entitled (full title of treatise/dissertation/thesis):


**Improving financial risk management in the petroleum industry of Nigeria**

considered the following ethics criteria (*please tick the appropriate block*):

	YES	NO
1. Is there any risk of harm, embarrassment of offence, however slight or temporary, to the participant, third parties or to the communities at large?		X
2. Is the study based on a research population defined as 'vulnerable' in terms of age, physical characteristics and/or disease status?		X
2.1 Are subjects/participants/respondents of your study:		
(a) Children under the age of 18?		X
(b) NMMU staff?		X
(c) NMMU students?		X
(d) The elderly/persons over the age of 60?		X
(e) A sample from an institution (e.g. hospital/school)?		X
(f) Handicapped (e.g. mentally or physically)?		X

3. Does the data that will be collected require consent of an institutional authority for this study? (An institutional authority refers to an organisation that is established by government to protect vulnerable people)		X
3.1 Are you intending to access participant data from an existing, stored repository (e.g. school, institutional or university records)?		X
4. Will the participant's privacy, anonymity or confidentiality be compromised?		X
4.1 Are you administering a questionnaire/survey that:		
(a) Collects sensitive/identifiable data from participants?		X
(b) Does not guarantee the anonymity of the participant?		X
(c) Does not guarantee the confidentiality of the participant and the data?		X
(d) Will offer an incentive to respondents to participate, i.e. a lucky draw or any other prize?		X
(e) Will create doubt whether sample control measures are in place?		X
(f) Will be distributed electronically via email (and requesting an email response)?		X
Note:		
<ul style="list-style-type: none"> <li>If your questionnaire <b>DOES NOT</b> request respondents' identification, is distributed electronically and you request respondents to return it <i>manually</i> (print out and deliver/mail); <b>AND</b> respondent anonymity can be guaranteed, your answer will be NO.</li> <li>If your questionnaire <b>DOES NOT</b> request respondents' identification, is <i>distributed via an email link and works through a web response system (e.g. the university survey system)</i>; <b>AND</b> respondent anonymity can be guaranteed, your answer will be NO.</li> </ul>		
Please note that if <b>ANY</b> of the questions above have been answered in the affirmative (YES) the student will need to complete the full ethics clearance form (REC-H application) and submit it with the relevant documentation to the Faculty RECH (Ethics) representative.		

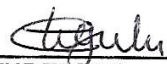
and hereby certify that the student has given his/her research ethical consideration and full ethics approval is not required.

  
 \_\_\_\_\_  
 SUPERVISOR(S)

12/11/2015  
 \_\_\_\_\_  
 DATE

  
 \_\_\_\_\_  
 HEAD OF DEPARTMENT

12/11/2015  
 \_\_\_\_\_  
 DATE

  
 \_\_\_\_\_  
 STUDENT(S)

12/11/2015  
 \_\_\_\_\_  
 DATE


Student(s) contact details (e.g. telephone number and email address):

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Please ensure that the research methodology section from the proposal is attached to this form.

## **ANNEXURE D: TURNITIN REPORT**

The attached Turnitin report provides proof that this thesis has been tested for plagiarism. The NMMU Business School requires a Similarity Index (SI) of not exceeding 24%. The attached report indicates a SI of 10%. Plagiarism has therefore not been committed in this thesis.

Student Submission	Paper ID	Submitted	Similarity
Ogulu, Christiana - (1 Submission)			
Part 5: <a href="#">Improving Financial Risk Management for the Petroleum Indust...</a>	783961555	14/03/17, 13:37	10% 

Turnitin Originality Report Improving Financial Risk Management for the Petroleum Industry of Nigeria by Christiana Ogulu from DBA Thesis submission - Part 5 (Moodle 57296915) (DBA Thesis: Generic site (Moodle 10235807)) Processed on 14-Mar-2017 13:44 SAST ID: 783961555 Word Count: 38993 Similarity Index 10% Similarity by Source Internet Sources: 8% Publications: 3% Student Papers: 6%.