

**COMPETITIVE STRATEGIES AND RESILIENCE OF OIL AND GAS
COMPANIES IN EQUATORIAL GUINEA**

BY

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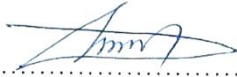
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**A DISSERTATION SUBMITTED TO THE SCHOOL OF BUSINESS IN PARTIAL
FULFILLMENT OF THEREQUIREMENTS FOR THE AWARD OF A
MASTERS OF BUSINESS ADMINISTRATION IN OILAND GAS
MANAGEMENT, INSTITUTE OF PETROLEUM STUDIES KAMPALA IN
AFFILIATION TO UCU.**

APRIL, 2022

DECLARATION

I, **Ntungwe Clovis Ajieh** hereby declare that this dissertation has never been anywhere for any academic award in any institution or university. All the sources have been rightfully acknowledged.



Ntungwe Clovis Ajieh

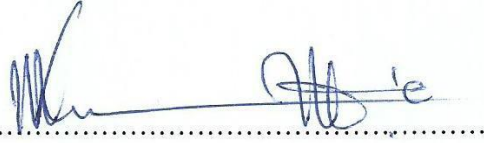
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Date

APPROVAL

This is to certify that, upon submission of this dissertation '**Competitive Strategies and Resilience of Oil and Gas Companies in Equatorial Guinea**' has been done under my supervision and is now ready for submission.



Professor Muhammed Ngoma (PhD)

Supervisor



Date

DEDICATION

This piece of work is dedicated to my grand Mother Mrs. Anna Dione and my daughter Peria-Jane Ajieh Ntungwe.

ACKNOWLEDGEMENTS

I want to thank the Almighty God for providing me with his grace and opportunity to finish this academic study.

I would also like to extend my sincere gratitude to all those who have contributed towards the successful completion of this dissertation.

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TABLE OF CONTENTS

DECLARATION.....	i
APPROVAL	ii
DEDICATION.....	iii
ACKNOWLEDGEMENTS	iv
TABLE OF CONTENTS	v
LIST OF TABLES	viii
LIST OF FIGURES	ix
LIST OF ACRONYMS	x
ABSTRACT.....	xi
CHAPTER ONE	1
INTRODUCTION.....	1
1.0 Introduction.....	1
1.1 Background to the Study.....	1
1.1.1 Historical Background	1
1.1.2 Theoretical Background.....	4
1.1.3 Conceptual Background.....	5
1.3. Statement of the Problem.....	7
1.4. Purpose of the Study/Major Objective.....	8
1.4.1. Specific Objectives	8
1.5. Research Questions	9
1.6. Conceptual Framework	9
1.8. Justification of the Study	10
1.9. Scope of the Study	10
1.9.1 Geographical Scope	10
1.9.2 Content Scope	11
1.9.3 Time Scope	11
1.10. Significance of Study.....	11
CHAPTER TWO	11
LITERATURE REVIEW	11
2.1 Introduction.....	11

2.2. Theoretical Review	12
2.3. Review of Related literature	13
2.3.1 Sustainability Strategy and Resilience of oil and gas companies	13
2.3.2 Innovation Strategy and Resilience of oil and gas companies.....	17
2.3.3 Diversification Strategy and Resilience of oil and gas companies	18
2.4 Related Studies.....	21
2.5. Research Gap	25
CHAPTER THREE	26
METHODOLOGY	26
3.0 Introduction.....	26
3.1 Research Design.....	26
3.3 Study Population.....	26
3.3 Sample Size.....	26
3.4. Sampling Technique	27
3.5 Data Collection Methods	28
3.5.1. Questionnaire Method.....	28
3.6 Data collection Instrument.....	28
3. 6.1 Questionnaire	28
3.7 Data Quality control.....	29
3.7.1 Validity	29
3.7.2 Reliability.....	29
3.8 Data Analysis Techniques.....	29
3.9 Ethical Considerations	30
3.10 Limitations of the Study.....	30
CHAPTER FOUR.....	32
DATA PRESENTATION, ANALYSIS AND INTERPRETATION	32
4.0 Introduction.....	32
4.1 Profile of Respondents	32
Table 4.1: Profile of respondents	32
4.2 Competitive Strategies	33
Table 4.2: Competitive strategies	34

4.3 Resilience of Oil and gas companies	36
4.4 Objective one; Relationship between sustainability and resilience of Oil and gas companies in Equatorial Guinea	39
4.5 Objective two; establishing the relationship between innovation and resilience of Oil and gas companies in Equatorial Guinea	40
4.6 Objective three; investigating the relationship between diversification and resilience of Oil and gas companies in Equatorial Guinea.....	40
CHAPTER FIVE	43
DISCUSSIONS, SUMMARY, CONCLUSIONS AND RECOMMENDATIONS.....	43
5.0 Introduction.....	43
5.1 Summary	43
5.2 Conclusions.....	46
5.3 Recommendations.....	47
5.4 Area for further research.....	48
REFERENCES.....	49
APPENDICES	58
APPENDIX I	58

LIST OF TABLES

Table 4.1: Profile of respondents	32
Table 4.2: Competitive strategies.....	34
Table 4.3: Resilience of Oil and gas companies	36
Table 4.4: Correlation between sustainability and resilience of Oil and gas companies in Equatorial Guinea	39
Table 4.5: Correlation between innovation and resilience of Oil and gas companies in Equatorial Guinea.....	40
Table 4.6: Correlation between diversification and resilience of Oil and gas companies in Equatorial Guinea	41
Table 4.7: Regression Analysis between the Dependent and Independent Variables	41

LIST OF FIGURES

Figure 1: Conceptual framework of the study	10
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LIST OF ACRONYMS

REG	Republic of Equatorial Guinea
MIC	Middle-Income Country
ESS	Energy Sector Strategy
GDP	Gross Domestic Product
CFA	Financial Community of Africa
GEPSA	Spanish Guinea Oil SA
MMH	Ministry of Mines and Hydrocarbons
LNG	Liquefied Natural Gas
NGO	Non-Governmental Organization
GCC	Gulf Cooperation Council
EBRD	European Bank for Reconstruction and Development
SOE	Special Operation Executive
RE	Renewable Energy
SONAGAS-EG	National Gas Society of Equatorial Guinea
SME	Small and Medium Enterprises
IPA	Independent Project Analysis
CCS	Carbon Capture Storage
CCUS	Carbon Capture Utilization and Storage
USD	United States Dollar
ESG	Environment Social Governance

ABSTRACT

The main goal of this study was to assess competitive strategies for business resilience of oil and gas companies amidst the challenges in the energy sector in Equatorial Guinea. The survey research design was adopted to assess competitive strategies and resilience of oil and gas companies amidst the challenges in the energy sector. Primary data was collected on competitive strategies and resilience of oil and gas companies as well as the challenges faced in the energy sector with the help of a structured questionnaire. A simple random sampling technique was adopted to select the oil and gas companies across the country with varied capacities and characteristics. The data was subjected to both descriptive statistics (percentage scores, frequency tables, graphs, and bar charts). Finally, the correlation and regression Statistic was adopted to determine if there exists any relationship between competitive strategies and resilience among the oil and gas companies. In response to these challenges, the companies adopted sustainability, Innovation, and diversification strategies in a bid to make their operations more resilient. Of the 3 competitive strategies identified in this study, Sustainability showed a positive moderate relation with resilience with a ($\beta=0.197$, Sig=0.001), while innovation also showed a positive moderate relationship with a ($\beta=0.816$, Sig=0.005). The study concluded that Diversification showed a strong positive correlation with business resilience (($\beta=0.313$, Sig=0.000). Diversification was termed competitive, as it looked at new products, new markets, new customers aimed to increase profitability, while realizing that things happen that don't fit with what is expected. In addition, Sustainability was seen to be moderately correlated with business resilience, because it fostered business longevity, while attempting to prevent undesirable acts from occurring. Also, Innovation strategy proved to be moderately correlated to business resilience, because it set clear goals, focuses efforts on reaching them, while modifying its functioning to be more efficient and effective. Although all the other strategies were seen to be uncompetitive weakly associated to business resilience, they can be used as control factors when designing policies and regulations to enhance the oil and gas industry in the country.

CHAPTER ONE

INTRODUCTION

1.0 Introduction

The digital revolution and information age has snowballed changes in technology, organizational formation, integration and development (Boas, 2005). In the era of liberalization of global markets, competition for market share and profitability has become more feisty and fiercer than ever. To survive and thrive, organizations world over, have adopted competitive strategies, to outwit their competitors (Porter, 1985). In the 21st century, the challenges of growth and profitability have been hinged on organizations ability to assimilate knowledge, information, skills, human resources and technological innovation at the same time (Peteraf, 2010). The success of organizations therefore depends on competitive resources, and organizational resilience can be able to marshal.

Competitive strategies will ensure a firm not only has the ability to compete favorably, but also survives global and local challenges on its market share and activities. Organizations can also develop strategic competencies on different aspects of operations such as pricing strategies, product differentiation, and quality of service among others. In an attempt to demystify competitive advantage and market structures, Porter (1985) engineered a “Model” to illustrate his theory of competitive strategies. Porter argues that the Five Forces define the rules of competition in any industry and determine its level of resilience. He asserts that competitive strategy must grow out of a sophisticated understanding of the rules of competition that determine an industry's attractiveness. Porter claims that “the ultimate aim of competitive strategy is to cope with and, ideally, to change those rules in the firm's behavior (Yabs, 2010).

However, this chapter entails the background to the study, statement of the problem, purpose of the study/major objective, specific objectives, research questions, conceptual framework, justification of the study, scope of the study, limitations of the study and significance of study in relation to assessing the competitive strategies that the oil and gas companies in Equatorial Guinea have put in place in order to remain resilient.

1.1 Background to the Study

1.1.1 Historical Background

According to Agnolucci (2009), the oil and gas industry worldwide has experienced constant volatility in pricing, operations, and competitive business environment, global health pandemic

or period of uncertainty. Significantly, most oil companies in Equatorial Guinea, and worldwide have had to review their strategies to respond to the dynamic and ever-changing oil and gas industry (Arouriet *al.*, 2012). In Equatorial Guinea, for instance, the oil and gas industry has expanded from few players a decade ago to 35 players currently in the industry (Sambu, 2012). Ideally, with the increase in companies dealing in oil and gas, came the increase in competitiveness for market shares. To do this, they require strategies referred to as Competitive strategies. The purpose of competitive strategy is to achieve a sustainable organizational resilience (SOR) and thereby enhance business performance (Ferrer, 2016).

The pitfalls of relying on oil and gas revenues to fuel an entire economy have long been recognized: strategies aimed at economic diversification have featured in national development plans of major hydrocarbon-exporting economies since the early 1970s. But the fall in oil prices that began in 2014 has given this debate a new urgency (Maritz, 2020). It provided a reminder of the damage that the downswing in a commodity cycle can bring, with non-hydrocarbons sectors bearing the brunt of the decline in revenues. It also raised further questions about the long-term structural implications of two ‘revolutions’ in the world of energy: shale as a new source of supply, and the gathering implications of clean energy transitions on the demand side, including improvements in fuel efficiency and the rise of electricity as an alternative to oil in parts of the transportation sector (Ludovico, 2021).

The current challenges facing the global oil and gas industry necessitates that the companies integrate sustainability, diversification, innovation, and management of technology strategies with their core strategies of portfolio management, operational efficiency and financial management. There are two distinct strategic options; Total life cycle Management and Management of Technologies. Environmental management and organizational efficiency are an integral component of both strategic options. Through Total Life Cycle Management, the companies address challenges of continued access to easily develop and produce reserves and legacy fields, efficiencies, costs and hosts expectations (Jones, 2014).

The key components of Total Life Cycle Management constitute portfolio management with enhanced relational strategies with the hosts. Operational Efficiency with continuous business process innovations, Sustainability with focus on long-term energy needs of the hosts, while considering aspects such as economic development, environmental protection and financial management which focuses on capital allocation to build scale and synergies in the country. Management of technologies addresses innovation challenges to tap the next big reserves in ultra-deep water, unconventional hydrocarbons. These strategies will provide differentiation

on capabilities to better identify, develop and deploy technologies. Key components of the Management of Technology strategy include R&D strategy, innovation fronts, organizational efficiency and operational performance. Oil and gas companies can position themselves either as cost-and efficiency driven companies, or as technology-driven companies, or both provided they have different organizational structures managing the two distinct options. Different oil producing countries successfully applies these competitive strategies to boosts organizational resilience (Heubel, 2021).

Norway discovered oil in 1969, but the country became a global reference for the oil and gas industry as it became one of the most prosperous countries in the world. The country's success story can not only be explained in the abundance of its natural resources, (oil production began in 1971), but the successful implementation of the different competitive strategies. These strategies include; investment in technological innovation, Research and development, State support and good governance which was reflected in policy formulation and implementation. The success story of the country was being referenced by countries like Brazil, which did not wish to rely its wealth generation solely on the exploitation of these natural resources ABDI, (2011): Morais & Turchi, (2016) cited in (Thune, 2018).

In the Middle East, Saudi Arabia's oil industry is one of the most important industries that have a rich and fascinating history is the oil and gas industry in Saudi Arabia. This history spans thousands of years and has played a significant role in structuring this business. According to the U.S EIA, (2021), Saudi Arabia holds 15% of the world's known oil reserves. It is the largest exporter of crude oil in the world and maintains the world's largest crude oil production capacity which stands at nearly 12 million barrels per day, making it one of the world's wealthiest nations per capita and, through possession of a large share of the world's oil resources, and economic power. The economic success of Saudi Arabia is built in part on its comparative advantages and in overcoming its disadvantages. The country's success lies in the management of Porter's model of competitive strategies (such as Cost leadership, Differentiation, Market focus) to generate various alternatives for the nation to gain a competitive advantage (Mohammed Hokroh, 2014).

Nigeria is the largest oil producer in Africa. It holds the largest natural gas reserves on the continent and was the world's fifth-largest exporter of liquefied natural gas (LNG) in 2018 (U.S EIA, 2020). Nigeria is the leading crude oil producer in Africa with a capacity of 2.5mbd, and is ranked 6th in the world. The country's oil and gas industry has continued to

demonstrate mixed performances marked by macroeconomic imbalances due to the unstable nature of oil prices at the international market. However, the country's oil and gas industry has remained resilient due to the various strategies that have been adopted. Oyakhire,(2020) points out some of these strategies which include; Corporate level strategy, Product diversification, Organizational performance and Operational efficiency.

In relation to Equatorial Guinea, the oil and gas industry in Equatorial Guinea continue to grow in leaps and bounds. The focus of this study was to assess the competitive strategies and resilience of oil and gas companies in the country. Indeed, a lot has been written about the oil and gas industry in the country. However, much of the literatures available don't provide an in-depth understanding of the competitive strategies and resilience of the oil and gas industry in Equatorial Guinea. African Development Bank, (2013) focuses on development and the national strategic development framework to transform equatorial guinea to an emerging economy by 2020.

Bertelsmann Stiftung's Transformation Index, (2020) identifies a number of bottlenecks hurting the economic competitiveness of EquatorialGuinea.these include; Lack of incentives by the government to protect the integrity of the free market; lengthy and beaurucratic procedures which discourage investors.high cost of business registration, corruption, provisional, structural and infrastructural hurdles, limited protection of minority investors etc. However, just like other literatures cited before, there too is silent on competitive strategies and resilience. The purpose of this paper is to analyze the oil and gas industry's competitiveness using Porter's Five Forces (Ferrer, 2016).

1.1.2 Theoretical Background

The study was guided by the business passive learning theory developed by Jovanic (1982). This learning model states that firms and managers of firms learn about their efficiency once they are established in the industry. Firms expand their activities when managers observe that their estimation of managerial efficiency has understated actual levels of efficiency. As firm ages, the owner's estimation of efficiency becomes more accurate, decreasing the probability that the output will widely differ from one year to another. The implication of this theoretical model is that smaller and younger firms should have higher and more viable growth rates (Stranova, 2001).

The study was also guided by Vijerwadena and De Zoysa (2001) theory of competitive strategies and Organizational performance. This theory outlines the relationship between

competitive strategies and organizational performance by considering the formal competitive strategies as the formal financial planning process and the formal financial control process; both of which are important contributors to business performance (Ormin, 2012). Specifically, firms using detailed plans (or comprehensive plans) for planning recorded significantly higher sales growth than those having “no written plans, whereas firms using more comprehensive plan variances also achieved better performance in sales growth, compared to firms using less comprehensive plan variances (Oscar, 2010). A comprehensive plan is seen as a detailed plan that encompasses aspects of all plans prepared under one umbrella. This theory has the limitation of considering competitive strategies in terms of formal planning process based on comprehensive plan and also performance only in terms of financial performance. This theory links plan participation with performance in management accounting where it stipulates that the opportunity given to subordinates through participation, that is, the upward or downward information sharing in planning process can stimulate their motivation and commitment to achieve the set target thereby enhancing performance. Participation therefore will enhance subordinates’ trust.

1.1.3 Conceptual Background

Competitive Strategies

Most Industries, Businesses, Organizations if not all organizations are in competitions; competition for factor inputs, competition for customers and ultimately competition for revenue that cover the cost of their chosen manner of survival (Rumelt, Schendel, & Teece, 1995). Competition is therefore at the core of success or failure of every business. Competition determines the appropriateness of firm's activities that can contribute to its performances such as, innovation, a cohesive culture or good implementation. The organization exists in the context of a complex political, economic, social, technological, environmental and legal world (Steve & Kate, 2005). The change in any of these variables will give rise to opportunities and others will exert threats on the organization- or both.

Competitive strategy has been described as, the search for a favorable competitive positioning in an industry, the fundamental arena in which competition occurs. Competitive strategy aims to establish a profitable and sustainable position against the forces that determine industry competition. The purpose of competitive strategy is to achieve a sustainable competitive advantage, which will make it resilient and thereby enhance business performance (Egorova, et al., 2016).

Sustainability is achieved when the strategies resist erosion or shocks. In other words, the competitive strategies adopted by a company to remain resilient and sustainable must resist duplication by other companies (Michael Porter , 1997). Porter's conceptual framing of competitive strategies encourages innovation which is one way that companies can remain relevant and profitable during turbulent periods. He argues that every competing industry has a competitive strategy, whether explicitly, i.e., developed through formal planning or implicit, which evolves through various functional planning activities. He developed an analytical framework which can be used to develop competitive strategies by focusing on the analysis of the industry structure and competitors using the five forces model that determine the state or competition in an industry.

Resilience

The word resilience comes from the latin word *resilire* which means to rebound or recoil. Resilience as a concept has been used widely over the years in various academic disciplines of study including both the natural and social sciences. In abstract terms, resilience seemed to be expressed by Nietzsche's (1889[1968]) famous aphorism: 'What does not destroy me, makes me stronger'. As remarked by William & Michelle, (2013) in Clair, (2007), resilience could also be referred to the mahayana buddhism expression; 'Changing poison. That is, [unhappiness and unfortunate circumstances] into medicine' (happiness and improvement). This expression was coined by the scholar Nagarjuna in Jones (2014), living from the second to the third century, means that whenever we experience loss, failure or suffering, we have the capacity to transform suffering into joy and good fortune. Resilience has been studied in psychology, economics, management and many others. In contemporary managerial use, resilience is a word with more than a little totemism implicit in it. If not exactly worshipped, or deified, it is certainly lauded as something that leaders and managers are expected to nurture and cultivate. In the context of organizations, being resilient suggests that these high priests of resilience, leaders and managers can turn toxicity and damage from a crisis into "substantial learning and improved, rather than damaged performance' Clair, (2007. P. 63). In practice, resilience entails not only resisting stressors, but also learning from them. With this learning, it would be argued that the totemic magic that often attaches to the cult of leadership can be demystified by cultivating means to be resilient, leading to a more enlightened and less enchanted view of the matter. For purposes of this research, the concept of resilience will be defined within the context of business, specifically the oil and gas industry.

Hamel & Valikangas, (2003) defined resilience is the ability to dynamically reinvent business models and strategies as circumstances change, necessitating alternatives as well as awareness of the ability to create a plethora of new options as compelling alternatives to dying strategies.

Organizational resilience, as advanced by Mallak, (1999), Patterson, (2007), Vogus & Sutcliffe, (2007) cited in Javier & Murphy, (2017) focus on resilience from the the human resource perspective, and place emphasis on the importance of having personel who adapt easily to changing situations. In their own words, resilience: “needs people who can respond quickly and effectively to change while enduring minimal stress, and it is these positive adaptive capabilities which differentiate the competition”.

Barabási, (2016) cited in Fabio, Luciano, & Marina, (2021) states that: “a system is resilient if it can adapt to internal and external errors by changing its mode of operations, without losing its ability to function. Hence, resilience is a dynamical property that requires a shift in the system’s core activities”. Barabási’s definition provides a holistic understanding of the word resilience by looking at the system in its entirety as opposed to specific aspects of the system. It is for this reason that this study will use Barabási’s concept of resilience to understand and better appreciate the various ways in which the oil and gas industry responds to threats and shocks.

Organizational Resilience

According to studies carried out by Folke, (2006), resilience is derived from socio-ecological studies, which refers to a system’s capacity to absorb and return to a stable state after a disruption. However, Barabási, (2016) definition of resilience provides a good starting point: “An industry is resilient if it can adapt to internal and external errors by changing its mode of operations, without losing its ability to function. Hence, it is a dynamical property that requires a shift in a company’s core activities. Hollnagel & Wood (2017) highlights a company’s capacity to anticipate, accompany, and be ready to respond and to proactively learn. Hollnagel, (2009) present’s four cornerstones of resilience; responding to what is happening, Flexible monitoring mechanism to identify critical problems, anticipating potential problems, and learning from experience.

1.3. Statement of the Problem

The oil and gas industry in Equatorial Guinea play a significant role in the economic development of the country as contributes to more than 60% of its Gross domestic product, 80% of its fiscal revenue and 86% of its exports by 2015 (U.S EIA, 2017), the country

becoming an OPEC member in 2017 (OPEC, 2021). Like other Industries, the industry has been going through changes as the oil and gas industry has been facing opposition from a public greatly concerned with the environmental impact of fossil fuels, ever-more skeptical shareholders, and challenges from policy makers seeking to simultaneously meet decarbonization goals and expected oil and gas demand. Amidst a global energy transition, the demand, financial, and social future of oil and gas companies is increasingly in question. This has been witnessed from the fall in the country's hydrocarbon activities which fell by 8.9%, with an overall decline in the GDP by 7.5% (ADB Group, 2021).

The global oil and gas industry are facing the of challenge of engaging and adapting to a changing policy on renewables, an investment landscape, increased tough environmental regulations, optimize the performance of its industrial base assets.(Cameron, et al., 2018).But also, to evolve in ways which don't support, but contribute and perhaps even lead efforts to decarbonize the energy system, Vahid Arabzadeh, Jani Mikkola, Justinas Jasiūnas, & Peter D.Lund (15 April 2020). Around the world there is at least a gradual shift from policies that have supported oil and gas production to policies that instead are starting to disincentivize fossil fuels, including carbon pricing and the European Union's Emission Trading Scheme (European Commission). In addition to disincentives, many governments are encouraging the use of substitute technology and fuel, especially renewable energy. A third method of decreasing carbon use is the organization of circular economies, in which materials are reused or recycled instead of disposed of at the end of their service life (Savini, 2021).

Investors are also becoming a strategic driver of decarbonization action and shifting attention to the environmental impact of oil and gas production through Environment Social Governance (ESG)-focused investing (John hill, 2020). Oil and gas companies are therefore obliged to respond by rethinking on how they do business. For the oil and gas companies to remain resilient and competitive, they need to rethink their business models and strategies. This study examined whether the existing strategies of these companies make them competitive and resilient amidst energy transition.

1.4. Purpose of the Study/Major Objective

The main goal of this study was to assess competitive strategies and resilience of oil and gas companies in Equatorial Guinea.

1.4.1. Specific Objectives

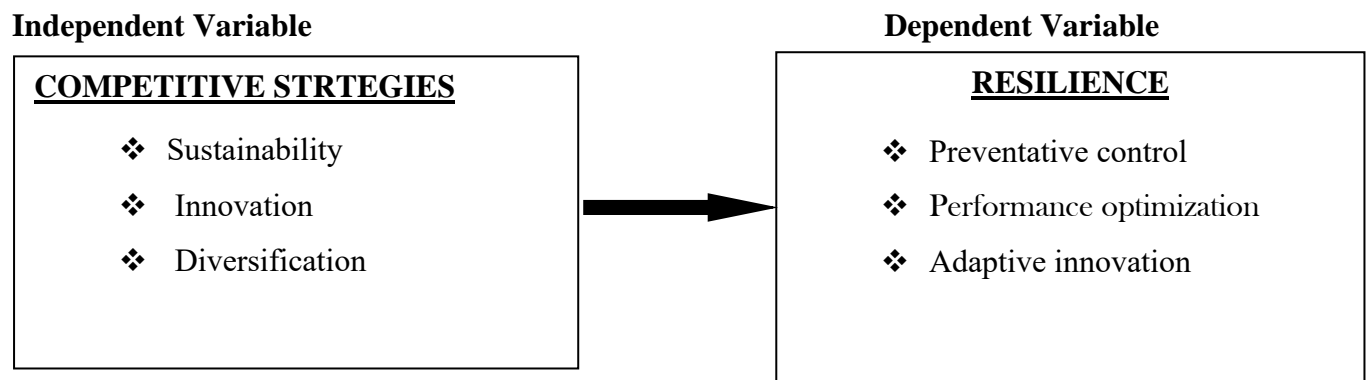
More specifically, the study seeks to;

- i). To examine the relationship between sustainability and resilience of oil and gas companies in Equatorial Guinea.
- ii). To assess the relationship between innovation and resilience of oil and gas companies in Equatorial Guinea.
- iii). To determine the relationship between diversification and resilience of oil and gas companies in Equatorial Guinea.

1.5. Research Questions

- i). What is the relationship between sustainability and resilience of oil and gas companies in Equatorial Guinea?
- ii). What is the relationship between innovation and resilience of oil and gas companies in Equatorial Guinea?
- iii). What is the relationship between diversification and resilience of oil and gas companies in Equatorial Guinea?

1.6. Conceptual Framework



Source: Conceptualized by the researcher (2022).

Figure 1. Conceptual framework of the study

According to the model above, the independent variable is competitive strategies, which affect the dependent variable resilience. Besides Profit, being competitive and remaining resilient are key objectives of a company especially important today because the business environment is becoming more dynamic and unpredictable (Martin Reeves & Kevin Whitaker, 2020). It is therefore important for every company to design business strategies that will make the business more resilient amidst evolving economic conditions (Ludovico Fassati, 2021). These strategies cut across the entire value chain of the business; from exploration and appraisal to production and marketing of products and services.

As Paul (2020) argued, strategies help companies understand what success actually looks like, provides a roadmap for business, shows their destination, and identifies useful stopping points along the way. This is aimed to boost resilience. Impact assessment, planning and the adoption of green technologies in the exploration will mitigate the negative impacts of climate change on human activities, Ferrer, (2016) cited Dante Rodríguez-Luna, Nuria Vela, Francisco Javier Alcalá, & Francisco Encina-Montoya, (2021). Also, air quality management and climate change mitigation/ adaptation, contaminated site management, and performance assurance and operational risk management are incorporated in the production strategies. Furthermore, efficient service and cost management, and regular market research strategy and performance carried out to determine customer needs (David Bednall, 2005). The nexus between the exploration, production and marketing strategies leads to business competitiveness and resilience among the oil and gas companies in Equatorial Guinea. An interaction of such strategies and their implication on business competitiveness and resilience with the context of the oil and gas sector.

1.8. Justification of the Study

Equatorial Guinea is one of Africa's major oil producers. The country became an OPEC member in May, 2017. Oil production during the last two decades has contributed to almost 90% of the country's GDP, raising Equatorial Guinea to a middle-income country, with the highest per capita income in sub-Saharan Africa. However, the country has been witnessing the effects of the recent turbulence in the oil and gas industry such as the current covid-19 pandemic, the fall in the demand of oil, price volatility, climate change, and governance challenges. Given this background, and the huge investment carried out by the companies, this study therefore sought to identify the competitive strategies that oil and gas companies in Equatorial Guinea are using to remain resilient.

1.9. Scope of the Study

This study focused on assessing the competitive strategies that the oil and gas companies in Equatorial Guinea has put in place in order to remain resilient.

1.9.1 Geographical Scope

The study was carried out in the oil rich regions of Equatorial Guinea.

1.9.2 Content Scope

In terms of content, competitive strategy (independent variable) was looked at in sustainability, innovation and diversification. Yet the independent variables (resilience), was measured in terms of preventative control, performance optimization and adaptive innovation.

1.9.3 Time Scope

The study focused on the period between 2015-2021 concerning the resilience of oil and gas companies in Equatorial Guinea, this being the period in which poor resilience a of oil and gas companies in Equatorial Guinea was reported most.

1.10. Significance of Study

The findings of the study will help the various stakeholders;

The government of Equatorial Guinea: the study will enable the government of Equatorial Guinea to identify the pressing challenges faced by oil and gas companies on which important policies can be drawn. Policies regarding the energy sector particularly ensuring a favorable environment to improve the competitiveness of the oil and gas companies.

The Oil and gas Companies: it will provide information on the factors affecting the competitiveness and resilience of the energy sector, and enable companies to tap in to existing strategies used by other companies in other oil producing countries to cope with the challenges in the energy sector.

Researchers: the study will serve as a stepping stone for further research work in this area since the findings of the study would not only recommend resilient strategies but suggest areas where further research can be carried out to leverage on the identified strategies. It will also contribute to the pool of existing literature the subject matter from which researchers can review sound empirical literature.

CHAPTER TWO LITERATURE REVIEW

2.1 Introduction

This chapter presents a critical review on the issues that have been explored and studied both theoretically and empirically in the existing literature on the competitive strategies and

resilience of oil and gas companies in developing countries and elsewhere in the World. It was important to note the existing literature in the works of other scholars who have written about the topic of study or those who have addressed similar issues as those of the variable that was available in the study. The literature was comparative in that it was in line with the specific objectives of the study; so as to make the researcher appreciate the contributions of the different researchers and identify the gaps.

2.2. Theoretical Review

The theoretical literature on the concept of global competitiveness can be grouped into two different paradigms. The first paradigm is the common neoclassical economics theory that idealizes the influence of competition and monopoly (Hvidt, 2007). The second paradigm is the non-standard political approach to the economy. The second paradigm is significantly influenced by the Marxian, Classical and Schumpeterian theory (Hvidt, 2007). However, most of these theories tend to lean on either paradigm and in some instances; they can have aspects of both philosophical approaches.

In this study, Strategic management theories have been applied, which actually stem from the systems perspective, contingency approach and information technology approach to corporate management. David, (2005) and Mohd Khairuddin Hashim (2005) highlight the profit-maximizing and competition-based theory, resource-based theory, survival-based theory, human resource-based theory, system theory is some of strategic management theories applicable to modern industrial organizations.

In other words, the traditional Industrial organizations view existing Profit maximizing and competition-based theory. This is based on the business's main objective to maximize long-term profit, develop a sustainable competitive advantage over competitive rivals in the external market. Philosophically, this theory leans more towards the common neoclassical economic theory. The industrial organization perspective is the foundation of this theory as it looks at the organization's external market positioning as the central factor for attaining and sustaining competitive advantage strategic management as a systematic model for assessing competition within an industry (Porter, 1981).

The Resource Based Theory (RBT) comes from the management philosophy that the resource of a firms' competitive advantage lies in their internal resources, as opposed to their positioning in the external environment. This theory is also a common neoclassical economics theory because it emphasizes the importance of resources of an organization as one way of having a competitive advantage. That is rather than simply assessing environmental opportunities and

threats in conducting business; competitive advantage depends on the unique resources and capabilities that a firm possesses (Barney, 1995). The Resource Based Philosophy of businesses forecasts that certain types of resources owned and controlled by firms have the potential and promise to generate competitive advantage and eventually superior firm performance (Ainuddin, et al., 2007). This theory was however criticized by (Fahy, 2000) who noted that the vast majority of contributions within the RBT have been of a conceptual rather than an empirical nature, with the result that many of its fundamental tenets still remain to be validated in practice.

The survival-based theory centers on the idea that organizations need to uninterruptedly adapt to its competitive environment in order to survive.

The human resource-based theory, emphasizes the importance of the human element in the process of strategy development of organizations. This theory has both characteristics of the common neoclassical economic theory and the political approach. The quality of human resource a country produces has a strong bearing on the output of the firm or firms that hire them. The political environment is a reflection of the system of governance which in turn has a bearing on the quality of citizens, their skill sets and levels of expertise. On the other hand, a strong human resource with the right skills and technical expertise has a strong impact on the profitability, sustainability, and competitiveness of the business.

The system theory is an interdisciplinary theory about every system in nature, in society and in many scientific domains as well as a framework with which we can investigate phenomena from a holistic approach Capra, (1997) cited in Mele, Jaqueline, & Francesco, (2010). It seeks to understand how the various components or parts of an organization or firm function. This study will therefore be grounded on the system theory as it is in alignment with Barabási, (2016) concept of resilience.

2.3. Review of Related Literature

The review of related literature was done following the study objectives as indicated below;

2.3.1 Sustainability Strategy and Resilience of Oil and Gas Companies

Sustainability is becoming a key survival issue for companies amid the mounting pressure by the public for more responsible practices and increasing regulations especially those that impact operations and costs (Abdalla and Siti-Nabiha, 2015; Bai et al., 2015). Companies have an increasing awareness of the environmental and social burdens associated with their activities (Seuring, 2013). Global companies have realized and recognized that sustainability is an

important aspect of their operations strategy (Mehregan et al., 2014). Against this background, companies may be held responsible for generating considerable social and environmental harm to society (Luthra et al., 2015). Companies are also perceived as engines of economic growth and wellbeing in society as well as key actors facilitating quality of life (Touboulic and Walker, 2016; Basta et al., 2018). As such, they are expected by society to take essential measures to prevent or at least mitigate adverse environmental and social impacts. Hence, companies are under increased stakeholder scrutiny to transform business behaviors and align their actions with the principles of sustainability (Panigrahi et al., 2019).

Environmental and Sustainability Indicators meets the demand of the present generation without compromising the ability of the next to meet theirs”. This provided a broad view of the concept of sustainability from which most definitions of the concept are based. Savitz and Weber (2006) defined sustainability as “any process that enables a company to create profit for its shareholders while protecting the environment and improving the lives of those with whom it interacts”. In the same vein, Carter and Rogers (2008) defined sustainability as “the strategic, transparent integration and achievement of an organization’s social, environmental, and economic goals in the systematic coordination of key interorganizational business processes for improving the long-term performance of the individual company and its supply chains”. Dyllick and Hockerts (2002) viewed the concept of sustainability as “as meeting the needs of a firm’s direct and indirect stakeholders (such as shareholders, employees, clients, pressure groups, communities etc.), without compromising its ability to meet the needs of future stakeholders as well.” While Hassini et al. (2012) defined sustainability as “the ability to conduct business with a long-term goal of maintaining the wellbeing of the economy, environment and society”. Sustainability improvement has become a commonly discussed goal of companies; however, it may be challenging to quantify how sustainable an enterprise is (Slaper and Hall, 2011).

John Elkington experimented with a modern method to evaluate sustainability in corporate America in the mid-1990s. This concept was termed the Triple Bottom Line (TBL) and was expanded to cover environmental and social considerations beyond conventional metrics of profitability, investment return and shareholder value. Elkington (1999) noted that the concept of sustainability is at the intersection of the three components: economic, environmental, and social concerns. Thus, emphasizing the need for environmental, social and economic performance for the improvement of the human quality of life. Winter and Knemeyer (2013)

argued that this implies that an organization should not only focus on economic aspects but also needs to focus on sustaining natural resources and the societies in which it operates.

Sustainability is becoming a key survival issue for companies amid the mounting pressure by the public for more responsible practices and increasing regulations especially those that impact operations and costs (Bai et al., 2015). Companies have an increasing awareness of the environmental and social burdens associated with their activities (Seuring, 2013). Global companies have realized and recognized that sustainability is an important aspect of their operations strategy. Against this background, companies may be held responsible for generating considerable social and environmental harm to society (Rezaee, 2018).

Companies are also perceived as engines of economic growth and wellbeing in society as well as key actors facilitating quality of life. As such, they are expected by society to take essential measures to prevent or at least mitigate adverse environmental and social impacts. Hence, companies are under increased stakeholder scrutiny to transform business behaviors and align their actions with the principles of sustainability (Panigrahi et al., 2019).

Disregarding sustainability can be costly for an organization and jeopardize its prospect if neglected (Porter and Kramer, 2002). Companies, therefore, need to address the social, economic, and environmental dimensions of sustainability to enhance their prospect. Because each of the three sustainability dimensions and its sub-dimensions is somewhat related to supply chain management (SCM) practices, the activities of the company need to balance all the three dimensions and its sub-dimensions. According to Spence (1974), to reap the benefits of its sustainability measures, a company must communicate and align all three sustainability dimensions with its SCM practices. According to Dentoni and Peterson (2011), signaling of sustainability efforts in the company's annual report is essential because it conveys to stakeholders the impression of how responsible a company is in comparison to others. Thus, organizations which have sustainability at the core of their business need to convey this value by signaling that they have been able to give sufficient importance and attention to some SCM practices by balancing all the dimensions of sustainability.

To remain attractive to investors, oil and gas companies will need to develop and communicate proactive integrated sustainability strategies that demonstrate continuously improving

emissions performance, along with a clear position on diversification into low carbon forms of energy (Basta et al., 2018).

Mehregan et al., (2014) noted that growing momentum for a transition to low carbon is creating new requirements for sustainability strategies. Evolving Government climate policies, direct public and shareholder activism, and changing investment strategies by major institutions are creating urgency for oil and gas companies to reduce emissions. Through improved technologies and economics, low carbon energies are increasingly competitive with oil and gas creating threats and opportunities for oil and gas companies.

As oil and gas will remain a core part of the global energy mix for the foreseeable future, companies will need to develop proactive and transparent sustainability strategies that maintain their license to operate in their traditional business, whilst identifying and securing new opportunities arising from the transition to a low carbon economy (Rezaee, 2018).

Sustainability has emerged as a strategy of critical importance for Oil and Gas companies. Sustainability is however a contested concept with divergent views and perspectives (Okeke, 2021). The concept of sustainable development was addressed by the UN's World Commission on Environment and Development's 1987 Brundtland Report (Brundtland, 1987). Sustainable development was defined as “a development that meets the demand of the present generation without compromising the ability of the next to meet theirs”. This provided a broad view of the concept of sustainability from which most definitions of the concept are based. Savitz & Weber, (2006) defined sustainability as “any process that enables a company to create profit for its shareholders while protecting the environment and improving the lives of those with whom it interacts”.

Carter and Rogers (2008) considered sustainability as “the strategic, transparent integration and achievement of an organization's social, environmental, and economic goals in the systematic coordination of key inter-organizational business processes for improving the long-term performance of the individual company and its supply chains”. John Elkington experimented with a modern method to evaluate sustainability in corporate America in the mid-1990s. This concept was termed the Triple Bottom Line (TBL) and was expanded to cover environmental and social considerations beyond conventional metrics of profitability, investment return and shareholder value. The concept of sustainability is at the intersection of the three components: economic, environmental, and social concerns. Thus, emphasizing the need for environmental, social, and economic performance for the improvement of the human quality of life(Elkington,

1999). Sustainability is becoming a key survival issue for companies amid the mounting pressure by the public for more responsible practices and increasing regulations especially those that impact operations and costs. Companies have an increasing awareness of the environmental and social burdens associated with their activities. Global companies have realized and recognized that sustainability is an important aspect of their operations strategy.

2.3.2 Innovation Strategy and Resilience of oil and gas companies

Alberto and Jukka (2019) noted that managing innovation across the portfolio of existing products, managers should consider new sources of energy, and new business/ industry models, involves taking risks beyond product and process innovation, especially related to customer engagement. To infuse a combination of digital technologies like AI, virtual reality, and robotics, for example to target process areas, such as drilling and completion. Provide tools to facilitate innovation. Instill discipline with key performance indicators for innovation valuation, measurement, and tracking success.

To maintain a strategic perspective of new technologies such as drilling, hydraulic fracturing, and nanotechnology, the management should create an innovation ecosystem that includes internal R&D, ventures, academia, strategic alliances, technologies and entrepreneurs, and technology startups, and constructing new open platforms that accelerate co-creation with partners. Establish governance across the ecosystem to align innovation objectives to track success, and to protect intellectual property. Empowering collaboration among product development engineers helps data scientists, sales, marketing, and finance to understand customer needs, product delivery, data trends, financial valuations, and business cases (Barabasi, 2016).

Dipak and Heather (2020) argued that elevating the innovation agenda with high-aptitude leaders and consider installing a Chief Digital Innovation Officer, this involves group innovation skills and competency together in specialized teams or organizations, or digital support centers. It is important to invest in customer experience strategy, data, and product development skills to add the capabilities needed for materials, modeling, and simulations, this helps to create learning environments to share insights from initiatives, encourage employees to take risks, and reward both fast failure and successful innovation.

Open Innovation has proved to be a successful concept that can facilitate technological development of oil and gas industries. According to Rahimi, et al., (2018), innovation includes

new material goods as well as new intangible services. Process innovations are new ways of producing goods and services; it is a matter of how existing products are produced. They may be technological or organizational. In this taxonomy, only goods and technological product innovations are material. The other categories are non-technological and intangible. The objective of this undertaking is process innovation new ways of producing goods and services that can be categorized as technological and organizational.

Edquist, et al. (2000) characterize the two types of process innovations as follows: technological process innovations are units of real capital (material goods) that have been improved through technical change and that lead to productivity growth in their use. Some of these goods may once have been product innovations that were sold as commodities to other firms. In other words, they can appear in two ‘incarnations’ in the economic system, where an industrial robot is a product innovation when produced by ABB in Vasteras and a process technology when used by Volvo in Goteborg.

It is not difficult to discover examples of companies that have been caught saying one thing and doing another. Sometimes, as with the Volkswagen emissions crisis, there is an apparent lack of emphasis on innovation (Cavico and Mujtaba, 2016). There are discrepancies in how organizational emphasis has been assessed and implemented at times; for example, some organizations have placed a considerable emphasis on innovation while indulging in environmentally harmful practices. Sometimes executives speak out publicly about innovation concerns, but they often fall short of the standards they set for themselves (Foote et al., 2015).

In certain cases, corporate organizations have issued rosy innovation and annual reports despite their underlying performance being bad (e.g., the Enron case). As Wilding et al. (2012) noted, many companies claim to address sustainability across their operations, but due to the lack of a comprehensive innovation framework to assess their emphasis, research has failed to verify whether this is indeed the case. Organizational process innovations are more productive ways to organize work; a new organizational form is introduced. These innovations are intangibles, that is, they are nonmaterial. Examples are just-in-time production, total quality management (TQM) and lean production (Abson et al., 2014).

2.3.3 Diversification Strategy and Resilience of oil and gas companies

Buliga et al. (2016) noted that many producers, including those in the Gulf and in Russia, are moving downstream in order to capture additional value from hydrocarbons resources, often

co-locating new petrochemical facilities with refineries to capture operational synergies. Expansion into petrochemicals offers the potential for more resilient margins. Demand for petrochemical products, even with growing attention to reducing single-use plastics and increasing recycling, is relatively robust across different energy scenarios. Since they are not combusted, there are no direct emissions associated with the use of oil or gas as petrochemical feedstock.

Natural gas has been a junior partner to oil in many producer economies, less lucrative and often produced as a by-product of oil developments as associated gas. But the potential significance of natural gas for diversification strategies is larger: it displaces oil in many applications and can also underpin an industrial strategy in a way that oil cannot. There is a need for strategic calculation about where and how gas often together with renewables can bring the best value to the energy system. Infrastructure is still lacking in some instances: Iraq and Nigeria still flare significant volumes of gas despite domestic shortages of electricity. Another challenge, especially in some parts of the Gulf, is to adapt pricing policies so that operators seek and produce gas as a commodity in its own right (Lennenluecke, 2017).

Ludovico (2021) noted that demand for electricity is growing fast across the Middle East and almost all of this increase has been met by gas-fired and oil-fired plants, despite the plummeting cost of new renewables-based electricity. Investment activity has picked up, but solar PV still makes up less than 1% of total generation in the Middle East; the opportunity cost of burning around 1.8 mb/d of oil to provide electricity is especially significant at a moment when global spare production capacity is starting to look thin. Even if oil were priced for generation at \$40/barrel (well below its current market value), unsubsidized solar would be displacing it quickly. Solar resources are abundant and are also ideally suited to meeting the peak in the region's summer generation due to air conditioners: in Saudi Arabia, daily demand for cooling peaks in the early afternoon and is a good match with peak solar PV output.

Pricing reforms have gained momentum in recent years, but the continued availability of oil products and natural gas at artificially low prices encourages wasteful consumption and distorts broader investment incentives across the economy. Even without subsidies, oil and gas exporters would still have a comparative advantage in energy, since a low production cost base can provide a stable low domestic price. This is of particular value in the case of gas and electricity, where a global commodity market is constrained by infrastructure bottlenecks and high transport costs, or does not exist at all. The report outlines how the implications of pricing

reform for energy consumers can be mitigated substantially if reform is paired with enhanced energy efficiency measures, with significant fiscal and environmental benefits (Maci, 2020).

Maritz (2020) conned that the ability to maintain oil and gas revenues at reasonable levels provides an important element of stability for the economy as a whole, especially when market conditions are tough. It is therefore crucial for producers to maintain flows of investment to the upstream, even as they seek to broaden investment flows across their economies. Venezuela provides a stark example of the risks; a collapse in upstream spending has exacerbated shortfalls in revenue and accelerated the downward spiral of the economy as a whole.

Okeke (2021) denoted that many producers have world-leading expertise in energy technologies; in addition to their potential in renewables, they are also well-positioned to develop new approaches that reduce or minimize the lifecycle emissions of oil and gas. Saudi Arabia and the United Arab Emirates, for example, are scaling up interest in carbon capture, utilization and storage. Oman is pioneering the use of large concentrating solar projects for enhanced oil recovery. There are large-scale opportunities to pair up solar energy with the Middle East's demand for desalination and clean water. It should not be taken for granted that the comparative advantage in energy of major producers diminishes in the energy transitions.

Makarenko and Kornilov (2018) examined the possibility of producing of sports products by OJSC Surgutneftegas. In the conditions of instability of global oil prices, the largest foreign and Russian oil and gas upstream companies are developing their strategies taking into account the diversification of both types of activities and sales markets. According to the strategy of many oils and gas, companies, diversification is shown in the implementation of targeted projects at oil refineries where they change the production structure. The company develops such direction as oil and gas chemistries. The possibility of additional diversification in Most European and OPEC member countries is performed through sale of non-fuel goods at the refuel stations belonging to the company. Besides, the company is launching the new products in segments of oils and bitumen.

Corporate-level strategies are implemented throughout the entire structure of oil and gas companies. Organizations that manage to deliver customer value unfliningly are those that revisit their corporate strategy regularly to improve areas that may not have delivered the intended results. Paynor, (2002) cited in Oyakhire,(2020). Product diversification is the

practice of expanding the initial market of a product. This strategy is used to enhance sales associated with an existing product line, which is mainly useful to a business that has been experiencing declining or stagnant turnover. Product diversification has been used as one of the attributes that aids competitive advantage for organizations through economics of scale and other synergies from using an organization's capabilities and resources across different product lines. Product diversification strategy creates an opportunity that provides additional synergy from diversification strategy which individual investors cannot create through their personal portfolio diversification. Such an option creates strategic edge in reducing business risk (Cavico and Mujtaba, 2016).

Operational efficiency is the judicious, efficient, and profitable use of resources available to an organization in perfect agreement with the laid down financial policies relating to a business operation (Dhillon & Vachhrajani, 2012). Operational efficiency measurements of management are needed when dealing with customer satisfaction, internal processes, and activities directed at improvement and innovation in the organization, which lead to future financial returns. However, Oyakhire, (2020) focuses on competitive strategies using the resource-based theory. This approach fails to look at the various units or components that make up the entire system and as such it does not provide a holistic understanding of how the other components of the system or organization contribute to its competitive strategy.

2.4 Related Studies

Bergstrom et al (2015) identified safety as an area of concern for oil and gas industries. Resilience has implications for different organizational settings having both internal and external factors which make resilience particularly interesting for the oil and gas industry. At the operational level, there are the complexities and risks of oil production. However, there are external changes that raise concern with organizational resilience. Externally, the oil and gas industry are characterized by a cycle and reactive approach to fluctuation in the price of raw materials and derivatives, according to Capello & Passalacqua, (2018). An important external factor is the increasing social and political pressure to change in profile from oil and gas to energy companies expanding their portfolios to renewable sources Zhong & Bazilian, (2018) Pickl (2019). This transition will certainly require adaptation and learning at different levels. Historically, there has been a preoccupation with the defensive agenda, with much less attention given to resilience as a progressive 'strategic enabler' that can help organizations adapt to the big, complex issues that arise in modern business – and seize the fresh opportunities that spring from them.

Organizational resilience has risen in prominence since it was first documented in guidance from BSI in 2014 (Cranfield School of Management, n.d), with various aspects on how to achieve resilience. They discussed a summary of academic evidence, business insights and new thinking', and called it the 'tension quadrant'. The tension quadrant comprised two core drivers: defensive (stopping bad things from happening) and progressive (making good things happen); and two approaches: consistency and flexibility. Historically, they built around the defensive mindset, with little attention given to resilience as a progressive, strategic enabler that can help organizations to adapt to the big, complex issues that arise in modern business. However, the risk mindset an organization adopts depends on the business model, among other factors – and there are different ways of thinking about resilience.

John Naisbitt (global paradox, 1994) and Charles Handy (the age of paradox, 1995) cited in Anne, Steven, & Krzysztof, (1997) had used the word to describe the ever apparent contradiction in the current, global business climate. Johnson, (1992) Charles Handy (1995) cited in (Maci, 2020) depicted in the story in a form of a sigmoid curve in which one, by applying its concept on given paradoxical issue, can subjectively interpret events, recognize patterns and apply solutions to given enigmas of a paradox based on the cycle of already known sequences such as life itself and life cycle of organizations. The popularity of paradox is simply its usefulness as a tool for understanding, and its attraction to thinkers (Naisbitt, 1994). It involves contradictory, mutually exclusive elements that are present and operate equally at the same time. (Cameron & Quinn, 1988 p. 2). Paradox has been defined as “an apparently unacceptable conclusion derived by apparently acceptable reasoning from apparently acceptable premises” (Sainsbury, 1988,p.1). The paradox is that environmental stimuli has been perceived and interpreted by organizational members. Daft and Weick proposed that “to some extent, the organization may create the external environment. The interpretation may shape the environment more than the environment shape the interpretation”. For businesses to achieve organizational resilience, there should be paradoxical thinking. Paradoxical thinking means that organizations don't have to commit to views that are defensive or progressive, consistent or flexible. They can instead manage the tensions between defensive and progressive views of organizational resilience.

It should be important to understand and master tension, so that the organization should avoid pitfalls of committing to one agenda. Overcommitting to the progressive agenda impedes resilience, because businesses constantly strive to achieve more can result in loss of focus on the core business. Overcommitting to the defensive agenda impedes resilience, because the

organization becomes inflexible and unproductive. Resilient organizations must be both highly adaptable to external market shifts, while simultaneously focused on their own coherent business strategy.

The Gazette, (2014) proposed a new methodology for achieving business resilience and moving forward, one that is built for readily-changing environments that many businesses have to operate in. The 4Sight model of organizational resilience which is a repeatable process consisting of four core processes: Foresight – constantly analyzed the market for potential threats and possible opportunities; Insight- gathering as much information as possible to gain an understanding of the status of the environment being operated in; Oversight monitoring and reviewing what has happened and assessing any changes, with a view to managing critical risks; Hindsight – learning from different events and experiences, so that future performance can be enhanced. This approach was as much about anticipating crises as it guarded against them. In this sense, it is very much in keeping with ISO 22316 Securities and Resilience guidelines and a new landmark standard relating to organizational resilience which attested that only when an organization has a 360-degree view of what is possibly threatening or is possibly an opportunity can it increase its level of resilience. It is therefore important to establish the resilience of competitive strategies used by oil and gas companies in different parts of the world, and find out if these strategies are applicable in Equatorial Guinea.

Muštra et al.(2016) cited in Alberto & Jukka, (2019) introduce the concept of adaptive resilience which considers a system's ability to withstand market or environmental shocks without losing the capacity to allocate resources efficiently. Alberto & Jukka, (2019) highlight the importance of adaptive changes to regional economic structures and social and institutional arrangements in order to maintain or restore a region's 'previous developmental path, or transit to a new sustainable path. Martin et al. (2016) cited in Alberto & Jukka, (2019) identify four conditions for adaptive resilience namely; Risk, Resistance, Reorientation, Recoverability- all of which are dependent on the scale, nature, and duration of the economic shock.

Bergström, et al, (2015) cited in Erik & Bjarne , (2020) identify Resilience engineering as the dominant theoretical perspective among both safety researchers and practitioners in the Norwegian offshore sector. They further note that resilience is a terminology that industry practitioners greatly subscribe to. However, despite the popular use of the word, there is no consensus on what resilience actually entails. What is clear, however, is that when evaluating resilience, it has to be looked at from multiple perspectives such as resilience of safety

standards and protocols, resilience of technical facilities, resilience in terms of development of the petroleum industry, and organizational resilience(Erik & Bjarne , 2020).

The Covid-19 pandemic represents an extraordinary and unpredictable event influencing the whole economy, society and the oil and gas industry in particular. The in-progress Covid-19 pandemic has generated enormous threats that have changed the whole society and economy forever. With more than 159 million confirmed cases and 3.3 million deaths recorded around the world (World Health Organization, 2021). The disruptions caused by the covid-19 caused an economic side effect estimated to be between US\$8.1 and US\$15.8 trillion globally, with the oil and gas industry bearing the brunt Schwab, (2020). This facilitated a drop in the industrial production index of 37.5, considered to be “the lowest reading since 2004” by UNCTAD. Covid-19 increasing fragilized the entire oil and gas industry, changed the way in which companies and institutions create, share, and capture value. The potential impacts caused by the virus pushed policy makers to identify possible strategic responses for increasing the organizational resilience in the oil and gas industry. Maritz, (2020) however, argued that the strategic measures adopted by oil and gas companies should be proactive to accurately leverage on opportunities.

Organizational resilience is considered a crucial issue in the field of strategic management (Vogus, Sutcliffe, & 2007). It is represented by the ability to deal with difficulties and environmental turbulence Buliga, et al., (2016); Holling & C.S, (1973); Lennenluecke & M.K., (2017); Vogus & Sutcliffe , (2007). An increase in the level of resilience meant that companies should explore the role of organizational ambidexterity and strategic consistency. (Iborra, et al., 2019). Sullivan-Taylor,, B., Branicki,, & L., (2011) “identified the need to be “more strategic and proactive.” That is, the ability to respond to unexpected events also depends on the size of the companies. Iborra, et al., (2019); Lennenluecke & M.K., (2017) highlighted that large firms tend to be focused on being prepared for disruptions, Lennenluecke & M.K., (2017); Weick,, K.E., Sutcliffe,, & K.M., (2015). Others implemented organizational routines to reduce complexity and uncertainty and be aligned with the external environment. Boisot,, .M., Child,, & J., (1999).

The covid-19 crisis led to the investments in digital technologies which was characterized by a fruitful solution to mitigate the disruptive effects, thus increasing the level of organizational resilience. Despite the challenge in measuring the value of the digital economy, the size ranged between 4.5% and 15.5% of the global GDP per annum(UNCTAD, 2019). Many oil and gas

companies have already started to direct their strategic investments to the development of digital infrastructures and ICT tools, with associated benefits in the adoption of new technologies like artificial intelligence (AI), block-chain, 5G, drones, and the Internet of Things (IoT). The McKinsey Global Institute analysis estimated that AI is able to advance the value in many sectors like transport and logistics, together with automotive, high-tech and oil and gas. According to McKinsey and Company, 49% of global work activities are expected to be replaced by machines by 2055, with an economic impact of 5G-enabled connectivity exceeding 12 trillion dollars in the next 15 years per Weinberg, & A.S., (2020). Records from the Imperial College London estimated that the higher the levels of connectivity, the higher the economy's growth rates; in particular, on average, a 10% increase in the adoption of mobile broadband causes an increase up to 2.8 % of economic growth implications of modern technology in the covid-19 epidemic. (Edquist., et al., 2017). Consequently, this study has focused on resilience of the oil and gas industry in Equatorial Guinea using the above criteria for evaluating resilience.

2.5. Research Gap

Although an imperative body of literature has emerged focusing on the global challenges faced by oil and gas companies, little research has been undertaken on the competitive strategies and resilience of the oil and gas companies amidst the challenges in the oil and gas sector. The current study assesses the competitive strategies and resilience of selected oil and gas companies operating in Equatorial Guinea. This empirical study will be conducted based on a number of selected oil and gas companies (Total, Exxon Mobil, Perenco, Addax petroleum etc.) operating in Equatorial Guinea. In addition, this study will make use of a survey research design that is limited to a one-time snap shot of the situation of the selected companies, with the time factor and replication not considered in testing the stability of the findings.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter presents the research design, the research population, and the sample size, sampling procedures, research instruments, validity and reliability of instruments, data gathering procedures, data analysis, ethical considerations and limitations of the study.

3.1 Research Design

The study adopted the mixed research paradigm which is inquiry involving data collection both qualitative and quantitative data integrating the two forms of data. The assumption of this inquiry is that the combination of the two approaches provided a more complete understanding of a research problem than either approach alone (Creswell, 2014). Qualitative paradigm collected data using a self-administered questionnaire for statistical data that was analyzed numerically using statistical procedures to make generalization of the findings (Zohrabi, 2013). The qualitative approach involved the use of interviews to explore the study problem through in-depth analysis (Oltmann, 2016). Using both approaches, the study drew statistical inferences and carry out an in-depth analysis.

3.3 Study Population

The study was conducted specifically among the oil and gas companies in Equatorial Guinea. For purposes of this study, the population was stratified into two strata and; the strata that belong to workers/administrators and beneficiaries was selected to inform the study, reason being these are the people who have the necessary information needed by the researcher. The total population of oil and gas companies to be used in this study was 2282.

3.3 Sample Size

In view of the large number of these Oil and gas companies a sample size was taken from a total population of two thousand, two hundred and eighty-two oil and gas companies in Equatorial Guinea. The sample size was determined by the use of Slovenes' formula in order to determine the minimum sample size with a ninety five percent confidence level. This size was been calculated as below to arrive at three hundred and forty-four.

This formula is stated as below;-

Slovene's formula

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

Here,

n = minimum sample size required

N - The target population 2,282

e² = the level of error raised to power 2 = 0.05²

1= constant

$$n = \frac{2282}{1 + 2282(0.05)^2}$$

$$n = \frac{2282}{1 + (2282 \times 0.0025)}$$

$$n = \frac{2282}{1 + (5.705)} = \frac{2282}{6.705}$$

$$n \cong 340$$

Twenty extra questionnaires were added to bring the total questionnaires to three hundred and sixty (360) in order to take care of questionnaires that are not retrieved.

3.4. Sampling Technique

Since there are sub-sectors of oil and gas companies to be investigated, stratified random sampling technique was employed in this research. In stratified random sampling, the study population is divided into areas, sections or categories with a proportionate random sample being taken from each section to ensure that the important variables investigated are sufficiently represented. Therefore, since the sub-sectors (strata) of the oil and gas companies investigated in this study had different number of enterprises, based on the inclusion criteria, a stratified random sampling by proportional allocation was used to ensure adequate representation of all the sub-sectors.

3.5 Data Collection Methods

3.5.1. Questionnaire Method

The questionnaire method intended to collect data from respondents by distributing forms in a written way. This is a direct consultation to the concerned respondents, concerning variables of interest to an investigation. Questionnaires were distributed to concerned respondents, and these questionnaires contained both closed and open questions so as to facilitate coding and data analysis.

The researcher used closed ended questionnaires as a data collecting method to obtain information from the study respondents. The questionnaires were designed according to the theme and objectives of the research. The questionnaire included both open and closed ended questions. A five-point rating scale was developed (1= strongly agree, 2= Agree, 3= Not Sure, 4= Disagree, and 5= strongly Disagree because the scale has a fairly robust characteristic. This allowed respondents to respond boldly and frankly to questions and enabled collection of vast amounts of data in a short time and was less expensive (Amin, 2005).

3.6 Data collection Instrument

3. 6.1 Questionnaire

A questionnaire was the major method used for data collection. The questionnaires were preferred for this study because it enabled the researcher reach a larger number of respondents within a short time, thus can make it easier to collect relevant information. The first section in the questionnaire was the face sheet, to collect data on profile of respondents. The second section in the questionnaire was competitive strategy. The third set had questions on resilience. All the questions are Likert Scaled on four points ranging from 1= strongly disagree, 2= disagree, 3= agree, and 4= strongly agree. The questionnaires contained close-ended questions to collect quantifiable data relevant for precise and effective correlation of research variables. They were also preferred to save time, enable respondents to easily fill out the questionnaires and keep them on the subject and relatively objective.

3.7 Data Quality control

3.7.1 Validity

Content validity of the instruments was established for both the self-administered questionnaire & interview guide. In particular, validity of the interview guide was established through seeking opinion of the supervisors on the relevance, wording, and clarity of the items (Rodrigues, Adachi, Beattie & MacDermid, 2017).

The questionnaire was given to three experts to judge the validity of questions according to the objectives. After the assessment of the questionnaire, the necessary adjustments were made bearing in mind the objectives of the study. Then a content validity index (CVI) was computed. Analysis was carried out using the statistical package for social scientists (SPSS. 16.0).

3.7.2 Reliability

To ensure the reliability of the instrument, the researcher used the pre-test method. The researcher also made consultations with the supervisor. During data collection the researcher avoided personnel biases, ensure careful record keeping, demonstrate a clear decision trail and ensure that interpretations of data are consistent and transparent during data collection (Nobal & Smith, 2015). The reliabilities of items in various constructs were tested using Cronbach Alpha (α) provided by SPSS. Reliability for the items in the different constructs was attained at $\alpha=0.70$ and above which is suggested minimum level (Taber, 2017). The items thus enabled collection of accurate and consistent data.

3.8 Data Analysis Techniques

Descriptive statistics such as frequency and percentages were used to present data on demographic characteristics of respondents. Means and standard deviations were used to present data on the extent of on the competitive strategies and resilience of oil and gas companies. Still data analysis was carried out following the study objectives whereby data on objective one, two and three were analyzed using correlation analysis to show the significant relationship between variables.

Primary data was collected using both qualitative and quantitative methods. However, it is noted that care and thought are given in the application of these methods since this study has taken a two-case study dimension.

All sources were in general treated and assessed as of high quality and the diversity of sources and nature of records was in accordance with the multifaceted and holistic approach of this thesis.

Secondary data was collected from journals, articles, books and authors that were written about the same topic and related literatures and topics of the different authors and researchers. For purposes of this study, secondary data was collected through the use of a literature survey. Under this method both published and non-peer reviewed materials such as books, reports, articles, documents, journals and internet resources were used. The literature survey further provided a useful background to compare the two study variables under investigation in selected ideal situations of the researchers' concentrations (Elo & Kyngas, 2008).

3.9 Ethical Considerations

The researcher had to respect the rights of others throughout the study ensuring that all materials adopted from others was acknowledged.

The researcher also had to seek consent of respondents before data collection. All the respondents were briefed on why they have been selected to participate in the study.

The researcher guaranteed the respondents of confidentiality by informing them that their responses remained anonymous.

During data analysis, the respondents were associated with data through descriptive statistics and a coding system that does not reveal their identities.

The researcher-maintained honesty by strictly analyzing the data collected without including personal opinion.

3.10 Limitations of the Study

Not all employees were available the time the study was conducted, some were on leave, out of office or sick. Some questionnaires that were distributed despite the efforts to ensure they are filled, some were not fully filled. So, to overcome this challenge, the researcher had to print more than enough questionnaires until the required sample was reached.

The issue of time, there was a number of delays in filling questionnaire, meetings also hindered the process. It happened in a rainy season where rains started early till late, it was difficult to manage the rain. The costs involved were also a limitation.

The budget was under estimated, and the cost moved beyond the budgeted funds which posed a great challenge in the long run.

The researcher had it in mind that, not all questionnaires may be returned completely answered nor even retrieved back due to circumstances on the part of the respondents such as travels, sickness, hospitalization and refusal/withdrawal to participate. It took time to ensure these respondents receive the questionnaires and answer them accordingly. The respondents were also reminded not to leave any item in the questionnaires unanswered and was closely followed up as to the date of retrieval.

Lack of extensive literature in similar type of studies and this limited a more comprehensive comparison to be made about the results of this study.

CHAPTER FOUR
DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.0 Introduction

This chapter shows the demographic characteristics of respondents, the relationship between sustainability and resilience of Oil and gas companies in Equatorial Guinea, relationship between diversification and resilience of Oil and gas companies in Equatorial Guinea, and the relationship between innovation and resilience of Oil and gas companies in Equatorial Guinea. Still this chapter presented the extent of competitive strategies, the extent of resilience of Oil and gas companies. The presentation here is based on data as collected from the field and as analyzed by the researcher.

4.1 Profile of Respondents

Respondents were asked to provide information regarding company age, company size, education qualification of the owner/manager, ownership status and the industry sub-sector. Their responses were summarized using frequencies and percentage distributions as indicated in table 4.1 below;

Table 4.1: Profile of Respondents

Category	Frequency	Percent
Company age		
1-10 years	131	38.5
11-20 years	129	37.9
21 years and above	80	23.5
Total	340	100
Company size		
10-49 employees	173	50.9
50-99 employees	97	28.5
Above 99 employees	70	20.6
Total	340	100
Highest education qualification		
Degree/Masters/PhD	8	2.4
Advanced Diploma/Diploma	216	63.5
Certificate	116	34.1
Total	340	100

Source: Primary data, 2022

Regarding company age, results indicate that 38.5% of Oil and gas companies had spent 1-10 years in the business, 37.9% had spent 11-20 years working and the last rated age category was

21 years and above (23.5%), therefore suggesting that majority of Oil and gas companies had spent 1-10 years which indicates a relatively enough experience in oil and gas business. Regarding company size, results in Table 4.1 indicate that majority of Oil and gas companies in Equatorial Guinea had 10-49 employees (50.9%), 28.5% had between 50-99 employees and only 20.6% had above 99 employees, therefore implying that majority Oil and gas companies in Equatorial Guinea cannot employ more than 10-49 employees, this could also be explained by the fact that these Oil and gas companies always apply high levels of technology whereby there would be no much work which may require more such a number of employees, another reason may be that the more employees recruited the more costs incurred when it comes to paying their salaries and wages.

With respect to highest education qualification, results indicate that majority of the Oil and gas companies' owner (63.5%) were Advanced Diploma/Diploma holders (63.5%), these were followed by certificate holders (34.1%), and lastly only 2.4% were Degree/Masters/PhD holders. Therefore, this indicates that more than three quarters of Oil and gas companies' owner were Advanced Diploma/Diploma/NCE holders. This could be explained by the fact that majority oil and gas business people didn't go far with studies since most of their time is spent on business which make them seeing no need of going far with studies and yet they always get some money, and another issue to explain low levels of academic qualification among Oil and gas companies owners in Equatorial Guinea is that there are few and light academic qualification required to be granted a working license but instead other requirements are needed such as the required minimum amount of capital, the required location where to set the oil and gas business, this makes the Oil and gas companies owners to see no need of going further with education hence end up attaining only Advanced Diploma/Diploma and certificate in oil and gas field.

4.2 Competitive Strategies

The independent variable in this study was competitive strategies among the Oil and gas companies in Equatorial Guinea, for which the researcher wanted to determine and was broken into three constructs namely; sustainability (with five questions); diversification (with four questions) and innovation (with four questions in the questionnaire). Each of these questions was based on the five-point Likert scale, where the respondents were asked to rate the extent to which they strongly agree, agree, neutral, disagree and strongly disagree with each question and their responses were analyzed using SPSS and summarized using means and standard deviation as indicated in tables 4.2;

Table 4.2: Competitive Strategies

Items on Competitive strategies	Mean	Std.	Interpretation	Rank
Sustainability				
This oil company has always identified traits and strengths important to the clients	4.24	1.024	Very satisfactory	1
This oil company has always applied SWOT analysis to identify the most valuable strengths	4.10	.667	Satisfactory	2
From the customer research or customer analysis, your oil company has always identified customer's top wants and needs that they can solve	4.02	.724	Satisfactory	3
This oil company has always axed the strengths their competitors also possess (making the sustainable competitive advantages unique)	4.01	1.116	Satisfactory	4
From the list of customer strengths, this oil company has always found the overlap between strengths they possess that provide value or solve customer needs	3.90	.934	Satisfactory	5
Average mean	4.05	.73317	Satisfactory	
Diversification				
This oil company has applied Lean Six Sigma and this has helped to release their top talent to focus on innovation, product development and operational excellence	4.27	.766	Very satisfactory	1
This oil company has used Talent with intuition, logic and analytic skills to thrive in the digital competitive environment	4.22	.766	Very satisfactory	2
Better access to data empowers senior leaders in this oil company to view entire organizational performance in a holistic manner	4.04	1.116	Satisfactory	3
This oil company has applied Augmented reality (AR) and drone technology to assess and inspect offshore oil rigs	4.04	1.095	Satisfactory	4
Average mean	4.14	.76641	Satisfactory	
Innovation				
This oil company always wants to exploit potential synergies	4.37	.911	Satisfactory	1
Diversification into new business areas does has given this oil firm an opportunity to significantly increase its profitability	3.72	.893	Satisfactory	2
This oil company's core business is in rise	3.25	1.027	Not sure	3
This oil company has always diversified through extending the scope of their operations into multiple markets	2.38	1.285	Poor	4
Average mean	3.43	.51605	Satisfactory	
Overall mean	3.87	.56748	Satisfactory	

Source: Primary data, 2022

Key for interpretation of means

Mean range	Response range	Interpretation
4.21 - 5.00	Strongly agree	Very satisfactory
3.41 - 4.20	Agree	Satisfactory
2.61 - 3.40	Neutral	Not sure
1.81 - 2.60	Disagree	Poor
1.00-1.80	Strongly disagree	Very poor

Results in table 4.2 indicate that competitive strategies (independent variable) in among the Oil and gas companies in Equatorial Guinea was rated satisfactory and this was indicated by the overall mean of 3.87, implying that the competitive strategies such as sustainability, diversification and innovation are highly practiced by the Oil and gas companies in Equatorial Guinea. This is also explained by that fact that competitive strategies help the Oil and gas companies in Equatorial Guinea to show the information about the acquisition and use of financial and other resources over a specific time period. Results in Table 4.2 further indicated that competitive strategies differ on different items and in different perspectives; for example, regarding sustainability, this construct was rated satisfactory (average mean=4.05), implying that the Oil and gas companies in Equatorial Guinea have always identified traits and strengths important to the clients. However, concerning sustainability results in Table 4.2 indicated that; this oil company has always applied SWOT analysis to identify the most valuable strengths (mean=4.10), from the customer research or customer analysis, your oil company has always identified customer's top wants and needs that they can solve (mean=4.02), this oil company has always axed the strengths their competitors also possess (making the sustainable competitive advantages unique) (mean=4.01), from the list of customer strengths, this oil company has always found the overlap between strengths they possess that provide value or solve customer needs (mean=3.90). This is all done because business enterprises use competitive strategies to lay out the planned financial goals and actions over a specified period of time.

With respect to diversification; this variable was rated satisfactory and this was indicated by the average mean of 4.14, hence implying that the Oil and gas companies in Equatorial Guinea have always applied Lean Six Sigma and this has helped to release their top talent to focus on innovation, product development and operational excellence, results in table 4.2 further indicated that the oil company has used Talent with intuition, logic and analytic skills to thrive in the digital competitive environment (mean=4.22). The results still indicated that the following items under diversification were agreed upon by the respondents; better access to data empowers senior leaders in this oil company to view entire organizational performance in a holistic manner (mean=4.04), this oil company has applied Augmented reality (AR) and drone technology to assess and inspect offshore oil rigs (mean=4.04), which implies that even though they are faced with unfavorable variances, still they always come up with certain solutions in order to overcome them such as preparing some money to be not used but help in solving emergency problems.

Concerning innovation; four items were used to measure this construct and was rated satisfactory (average mean=3.43), this implies that diversification into new business areas has given this oil firm an opportunity to significantly increase its profitability. The results in table 4.2 further indicated that the oil company always wants to exploit potential synergies (mean=4.37), this oil company's core business is in rise (mean=3.25), the oil company has always diversified through extending the scope of their operations into multiple markets (mean=2.38).

4.3 Resilience of Oil and gas companies

The dependent variable in this study was resilience of Oil and gas companies in Equatorial Guinea, this variable was broken into four three and these are; protective control (with 4 questions in the questionnaire), performance optimization (with four items) and Adaptive innovation (with 4 questions in the questionnaire). Most of these questions were based on a five-point Likert scale and respondents were asked to indicate the extent to which they strongly agree, agree, not sure, disagree and strongly disagree with each question or item. Their responses were analyzed using SPSS and summarized using means and ranks as indicated in table 4.3 below;

Table 4.3: Resilience of Oil and gas companies

Items on resilience of Oil and gas companies	Mean	Std	Interpretation	Rank
Protective control				
This oil company regularly assess whether programs and programmatic approaches are effective in accomplishing organization's strategic goals.	4.26	1.311	Very Satisfactory	1
This oil company regularly assess whether the overall efforts are generating the positive social outcomes and changes at the center of organizational mission and reason	3.95	.930	Satisfactory	2
This company has always used effective workflows and project management practices to clarify project roles and responsibilities, balance priorities, and move initiatives forward to completion	3.53	1.281	Satisfactory	3
This company uses a process for stakeholders across the organization to assess the strategic value of new program, project, and partnership opportunities before they commit to them	2.27	1.452	Poor	4
Average mean	3.50	.85643	Satisfactory	
Performance optimization				
The company has reliable operations (administrative, finance, human resources, and technology) systems that are well integrated with programs and support on-site and remote work	4.09	.958	Satisfactory	1
This oil company uses consistent, transparent practices to document and communicate the titles, roles, responsibilities, accountabilities, salary ranges, and authorities of all staff positions	4.05	1.064	Satisfactory	2

Items on resilience of Oil and gas companies	Mean	Std	Interpretation	Rank
Protective control				
This oil company regularly assess whether programs and programmatic approaches are effective in accomplishing organization's strategic goals.	4.26	1.311	Very Satisfactory	1
This oil company regularly assess whether the overall efforts are generating the positive social outcomes and changes at the center of organizational mission and reason	3.95	.930	Satisfactory	2
This company has always used effective workflows and project management practices to clarify project roles and responsibilities, balance priorities, and move initiatives forward to completion	3.53	1.281	Satisfactory	3
This company uses a process for stakeholders across the organization to assess the strategic value of new program, project, and partnership opportunities before they commit to them	2.27	1.452	Poor	4
This company consistently uses a fair performance management system that includes specific and timely communication about expectations and performance improvement	3.90	1.141	Satisfactory	3
The company has consistently used effective practices to recruit the right mix of new people in timely ways, welcome them, and equip them for success	3.83	1.249	Satisfactory	4
Average mean	3.97	.97366	Satisfactory	
Adaptive innovation				
This oil company consistently uses effective practices to manage consultants and vendors and ensure quality, timely, and cost-effective deliverables	4.34	.692	Very satisfactory	1
When the company needs to allocate significant resources, the managers consistently use an effective process to ensure the need is justified and choice is the best value	4.14	.888	Satisfactory	2
This oil company has sufficient, inclusive, fair, clear, and up-to-date internal policies	3.92	1.238	Satisfactory	3
The company has consistently included risk assessment in daily decision-making and broader planning	2.75	1.494	Not sure	4
Average mean	3.78	.71506	Satisfactory	
Overall mean	3.64	.68907	Satisfactory	

Source: Primary data, 2022

Key for interpretation of means

Mean range	Response range	Interpretation
4.21 - 5.00	Strongly agree	Very satisfactory
3.41 - 4.20	Agree	Satisfactory
2.61 - 3.40	Neutral	Not sure
1.81 - 2.60	Disagree	Poor
1.00-1.80	Strongly disagree	Very poor

Results in table 4.3 indicated that the level of resilience of Oil and gas companies in Equatorial Guinea is rated satisfactory and this was indicated by the overall mean of 3.64, which implies that the Oil and gas companies in Equatorial Guinea are able to work at a break even though their strategies are still poor. Results in Table 4.3 further indicate that the resilience of Oil and gas companies differs on different items and in different perspectives; for example, regarding protective control, this construct was rated satisfactory (average mean=3.50), implying that the Oil and gas companies in Equatorial Guinea regularly assess whether programs and programmatic approaches are effective in accomplishing organization's strategic goals. However, concerning protective control results in Table 4.3 indicated that; the company has always used effective workflows and project management practices to clarify project roles and responsibilities, balance priorities, and move initiatives forward to completion (mean=3.53). Results in Table 4.3 further indicated that the Oil and gas companies in Equatorial Guinea have always used a process for stakeholders across the organization to assess the strategic value of new program, project, and partnership opportunities before they commit to them (mean=2.27).

Concerning Performance optimization; results in table 4.3 indicated that this construct was rated satisfactory and this was indicated by the average mean of 3.97, hence implying that the Oil and gas companies in Equatorial Guinea have reliable operations (administrative, finance, human resources, and technology) systems that are well integrated with programs and support on-site and remote work. The results in table 4.3 further indicate that the Oil and gas companies in Equatorial Guinea have always used consistent, transparent practices to document and communicate the titles, roles, responsibilities, accountabilities, salary ranges, and authorities of all staff positions (mean=4.05), the company consistently uses a fair performance management system that includes specific and timely communication about expectations and performance improvement (mean=3.90), hence implying that they have outcompeted the companies which also deal in the same businesses. The Oil and gas companies have consistently used effective practices to recruit the right mix of new people in timely ways, welcome them, and equip them for success (mean=3.83), hence indicating a sign of steady progress.

With respect to adaptive innovation; this construct was rated satisfactory and this was indicated by the average mean of 3.78, hence implying that the Oil and gas companies in Equatorial Guinea have attained performance optimization, results in table 4.3 further indicated that the oil company consistently uses effective practices to manage consultants and vendors and ensure quality, timely, and cost-effective deliverables (mean=4.34), hence implying that the employees Oil and gas companies in Equatorial Guinea always perform their duties effectively. The results still

indicated that when the company needs to allocate significant resources, the managers consistently use an effective process to ensure the need is justified and choice is the best value (mean=4.14), This oil company has sufficient, inclusive, fair, clear, and up-to-date internal policies (mean=3.92), the company has consistently included risk assessment in daily decision-making and broader planning (mean=2.75).

4.4 Objective one; Relationship between sustainability and resilience of Oil and gas companies in Equatorial Guinea

The first objective in this study was to establish whether there is a relationship between sustainability and resilience of Oil and gas companies in Equatorial Guinea. To meet this, a null hypothesis was stated that there is no relationship between sustainability and resilience of Oil and gas companies in Equatorial Guinea. This hypothesis was tested using Pearson's Linear Correlation aided by SPSS as indicated in table 4.4 below;

Table 4.4: Correlation between sustainability and resilience of Oil and gas companies in Equatorial Guinea

Variables correlated	R-value	Sig-value	Interpretation	Decision on Ho
Sustainability Vs Resilience of Oil and gas companies	.524	.000	Positive Moderate relationship	Rejected

Source: Primary data, 2022

Results in table 4.4 indicated a positive moderate relationship between sustainability and resilience of Oil and gas companies in Equatorial Guinea, since the sig. value (0.000) was less than 0.05 which is the maximum level of significance required to declare a significant relationship in social sciences (Amin, 2005). This implies that there is a direct relationship between sustainability and the level of resilience of Oil and gas companies in Equatorial Guinea, here the stated null hypothesis was rejected basing on these results and hence meaning that effective sustainability increases the level of resilience of Oil and gas companies in Equatorial Guinea.

4.5 Objective two; establishing the relationship between innovation and resilience of Oil and gas companies in Equatorial Guinea

The second objective in this study was to establish the relationship between innovation and resilience of Oil and gas companies in Equatorial Guinea. The researcher stated a null hypothesis that there is no relationship between innovation and resilience of Oil and gas companies, therefore to achieve this objective and to test this null hypothesis, the researcher correlated the means on both variables by using the Pearson's Linear Correlation Coefficient as indicated in table 4.5 below;

Table 4.5: Correlation between innovation and resilience of Oil and gas companies in Equatorial Guinea

Variables correlated	R-value	Sig-value	Interpretation	Decision on Ho
Innovation Vs Resilience of Oil and gas companies	.390	.000	Positive moderate relationship	Rejected

Source: Primary data, 2022

Results in table 4.5 indicated a positive moderate relationship between innovation and resilience of Oil and gas companies in Equatorial Guinea and this was indicated by the sig. value (0.000) which was less than 0.05 and this is the maximum level of significance required to declare a significant relationship in social sciences. This implies there is a direct relationship between good and better innovation and the level of resilience of Oil and gas companies, here the stated null hypothesis was rejected basing on these results and hence indicating that good and better innovation improves the resilience of Oil and gas companies in Equatorial Guinea.

4.6 Objective three; investigating the relationship between diversification and resilience of Oil and gas companies in Equatorial Guinea

The third objective in this study was to investigate the relationship between diversification and resilience of Oil and gas companies in Equatorial Guinea, to achieve this objective and to test this null hypothesis, the researcher correlated the means on both variables by using the Pearson's Linear Correlation Coefficient (PLCC) as indicated in table 4.6;

Table 4.6: Correlation between diversification and resilience of Oil and gas companies in Equatorial Guinea

Variables correlated	R-value	Sig-value	Interpretation	Decision on Ho
Diversification Vs Resilience of Oil and gas companies	.567	.000	Positive Moderate relationship	Rejected

Source: Primary data, 2022

The Pearson's Linear Correlation Coefficient (PLCC) results in table 4.6 indicated the there is a relationship between diversification and resilience of Oil and gas companies in Equatorial Guinea, since the sig. value (0.000) was far less than 0.05 and R-value (0.567) which is the maximum level of significance required to declare a significant relationship in social sciences. Therefore, this implies that effective diversification has a direct relationship with resilience of Oil and gas companies in Equatorial Guinea.

Table 4.7: Regression Analysis between the Dependent and Independent Variables

Variables regressed	Adjusted r ²	F-value	Sig.	Interpretation	Decision on Ho
Resilience of Oil and gas companies Vs Competitive strategies	.656	63.138	.000	Significant effect	Rejected
Coefficients	Beta	t-value	Sig.		
(Constant)	.967	4.148	.000	Significant effect	Rejected
Sustainability	.197	3.236	.001	Significant effect	Rejected
Diversification	.313	5.265	.000	Significant effect	Rejected
Innovation	.186	2.804	.005	Significant effect	Rejected

Source: Primary data, 2022

Regression analysis results in table 4.7 above indicated that competitive strategies accounted for 65.6% on resilience of Oil and gas companies in Equatorial Guinea and this was indicated by adjusted r squared of 0.656 leading to an implication that competitive strategies significantly affect the resilience of Oil and gas companies in Equatorial Guinea. With respect to the coefficients table, results further indicated that of all the aspects of competitive strategies, diversification accounted for the biggest influence and a positive change on resilience of Oil and gas companies in Equatorial Guinea ($\beta=0.313$, Sig=0.000).

CHAPTER FIVE

DISCUSSIONS, SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This chapter focuses on the summary of findings, conclusions, recommendations based on the conclusions of this study and suggested areas that need further research following the study objectives and study hypothesis.

5.1 Summary

This study aimed at establishing the relationship between competitive strategies and resilience of Oil and gas companies in Equatorial Guinea, three specific objectives guided this study and these were; (i) to investigate the relationship between sustainability and resilience of Oil and gas companies in Equatorial Guinea, (ii) to establish the relationship between innovation and resilience of Oil and gas companies in Equatorial Guinea, and (iii) to investigate the relationship between diversification and resilience of Oil and gas companies in Equatorial Guinea.

Objective one; the relationship between sustainability and resilience of Oil and gas companies in Equatorial Guinea

The findings indicated a positive significant relationship between sustainability and resilience of Oil and gas companies in Equatorial Guinea (sig. value=0.000) was far less than 0.05 and R-value=0.524. Therefore, this implies that improvement in sustainability can lead to an increase in the level of resilience of Oil and gas companies in Equatorial Guinea, and failure to improve sustainability will reduce on the resilience of Oil and gas companies, here the stated null hypothesis was rejected basing on these results and hence meaning that effective sustainability increases the level of resilience of Oil and gas companies in Equatorial Guinea. This is in line with Okeke (2021) who argued that many producers have world-leading expertise in energy technologies; in addition to their potential in renewables, they are also well-positioned to develop new approaches that reduce or minimize the lifecycle emissions of oil and gas. Saudi Arabia and the United Arab Emirates, for example, are scaling up interest in carbon capture, utilization and storage. Oman is pioneering the use of large concentrating solar projects for enhanced oil recovery. There are large-scale opportunities to pair up solar energy with the Middle East's demand for desalination and clean water. It should not be taken for granted that the comparative advantage in energy of major producers diminishes in the energy transitions.

Natural gas has been a junior partner to oil in many producer economies, less lucrative and often produced as a by-product of oil developments as associated gas. But the potential significance of natural gas for diversification strategies is larger: it displaces oil in many applications and can also underpin an industrial strategy in a way that oil cannot. There is a need for strategic calculation about where and how gas often together with renewables can bring the best value to the energy system. Infrastructure is still lacking in some instances: Iraq and Nigeria still flare significant volumes of gas despite domestic shortages of electricity. Another challenge, especially in some parts of the Gulf, is to adapt pricing policies so that operators seek and produce gas as a commodity in its own right (Lennenluecke, 2017).

Sustainability is becoming a key survival issue for companies amid the mounting pressure by the public for more responsible practices and increasing regulations especially those that impact operations and costs (Bai et al., 2015). Companies have an increasing awareness of the environmental and social burdens associated with their activities (Seuring, 2013). Global companies have realized and recognized that sustainability is an important aspect of their operations strategy. Against this background, companies may be held responsible for generating considerable social and environmental harm to society (Rezaee, 2018).

Objective two; establishing the relationship between innovation and resilience of Oil and gas companies in Equatorial Guinea

The second objective in this study was to establish the relationship between diversification and resilience of Oil and gas companies in Equatorial Guinea. The findings indicated a positive significant relationship between innovation and resilience of Oil and gas companies in Equatorial Guinea and this was indicated by R-value=0.390 and sig. value (0.000) which was less than 0.05, and this is the maximum level of significance required to declare a significant relationship in social sciences (Amin, 2005), hence implying that effective innovation can lead to an increase in the level of resilience of Oil and gas companies and ineffective/poor innovation still can reduce on the resilience of Oil and gas companies. This is also in line with Alberto and Jukka (2019) who noted that managing innovation across the portfolio of existing products, managers should consider new sources of energy, and new business/ industry models, involves taking risks beyond product and process innovation, especially related to customer engagement. To infuse a combination of digital technologies like AI, virtual reality, and robotics, for example to target process areas, such as drilling and completion. Provide tools to facilitate innovation. Instill discipline with key performance indicators for innovation valuation, measurement, and tracking success.

To maintain a strategic perspective of new technologies such as drilling, hydraulic fracturing, and nanotechnology, the management should create an innovation ecosystem that includes internal R&D, ventures, academia, strategic alliances, technologies and entrepreneurs, and technology startups, and constructing new open platforms that accelerate co-creation with partners. Establish governance across the ecosystem to align innovation objectives to track success, and to protect intellectual property. Empowering collaboration among product development engineers helps data scientists, sales, marketing, and finance to understand customer needs, product delivery, data trends, financial valuations, and business cases (Barabasi, 2016).

Dipak and Heather (2020) noted that elevating the innovation agenda with high-aptitude leaders and consider installing a Chief Digital Innovation Officer; this involves group innovation skills and competency together in specialized teams or organizations, or digital support centers. It is important to invest in customer experience strategy, data, and product development skills to add the capabilities needed for materials, modeling, and simulations, this helps to create learning environments to share insights from initiatives, encourage employees to take risks, and reward both fast failure and successful innovation.

Objective three; investigating the relationship between diversification and resilience of Oil and gas companies in Equatorial Guinea

The third objective in this study was to investigate the relationship between diversification and resilience of Oil and gas companies in Equatorial Guinea, to achieve this objective and to test this null hypothesis, the researcher correlated the means on both variables by using the Pearson's Linear Correlation Coefficient (PLCC). The findings indicated that there is a relationship between diversification and resilience of Oil and gas companies in Equatorial Guinea, since the sig. value (0.000) was far less than 0.05 and R-value (0.567) which is the maximum level of significance required to declare a significant relationship. Therefore, this implies that good diversification can lead to increase in resilience of Oil and gas companies in Equatorial Guinea and poor diversification reduces it.

The findings still indicated that competitive strategies significantly affect the resilience of Oil and gas companies in Equatorial Guinea since it contributes 65.6% on the resilience of Oil and gas companies and this was indicated by adjusted r squared of 0.656, with respect to the coefficients, results further indicated that of all the aspects of competitive strategies,

diversification accounted for the biggest influence and a positive change on the resilience of Oil and gas companies in Equatorial Guinea ($\beta=0.313$, $\text{Sig}=0.000$). This finding is in line with Ludovico (2021) who noted that demand for electricity is growing fast across the Middle East and almost all of this increase has been met by gas-fired and oil-fired plants, despite the plummeting cost of new renewables-based electricity. Investment activity has picked up, but solar PV still makes up less than 1% of total generation in the Middle East; the opportunity cost of burning around 1.8 mb/d of oil to provide electricity is especially significant at a moment when global spare production capacity is starting to look thin. Even if oil were priced for generation at \$40/barrel (well below its current market value), unsubsidized solar would be displacing it quickly. Solar resources are abundant and are also ideally suited to meeting the peak in the region's summer generation due to air conditioners: in Saudi Arabia, daily demand for cooling peaks in the early afternoon and is a good match with peak solar PV output.

5.2 Conclusions

Objective one; relationship between sustainability and resilience (Preventive Control) of Oil and gas companies in Equatorial Guinea

From the findings of the study, the positive moderate relationship between sustainability and resilience of Oil and gas companies in Equatorial Guinea, sustainability it is important in fostering good resilience among Oil and gas companies in Equatorial Guinea, this is because improvement in sustainability can lead to an increase in the level of resilience of Oil and gas companies. ($\beta=0.197$, $\text{Sig}=0.001$).

Objective two; relationship between innovation and resilience (Performance Optimization) of Oil and gas companies in Equatorial Guinea

From the findings of the study, the researcher concluded that innovation is crucial in promoting high level of resilience of Oil and gas companies in Equatorial Guinea ($R\text{-value}=0.390$ and $\text{sig. value}=0.000$), this is because effective innovation can lead to an increase in the level of resilience of Oil and gas companies and ineffective/poor innovation still can reduce on the resilience of Oil and gas companies. ($\beta=0.816$, $\text{Sig}=0.005$).

Objective three; relationship between diversification and resilience (Adaptive Innovation) of Oil and gas companies in Equatorial Guinea

From the findings of the study, it was concluded that diversification is positively and significantly related to resilience of Oil and gas companies in Equatorial Guinea and this means that improvement in diversification will increase on the resilience of Oil and gas companies in Equatorial Guinea. Still, this is because that of all the aspects of competitive strategies, diversification accounted for the biggest influence and a positive change on the resilience of Oil and gas companies in Equatorial Guinea ($\beta=0.313$, Sig=0.000).

5.3 Recommendations

Having given research findings, discussions and conclusions derived there from, this last section of the chapter makes recommendations arising from the significant findings of the study, objective by objective;

Objective one; relationship between sustainability and resilience (Preventive Control) of Oil and gas companies in Equatorial Guinea

Resulting from the findings on the first objective in this study, the researcher recommends that if the level of resilience is to be improved the Oil and gas companies in Equatorial Guinea should comprehensively embrace sustainability, there is need for a comprehensive and forward-looking sustainability which creates an enabling framework for the resilience of Oil and gas companies in Equatorial Guinea. Improvement in sustainability will guide proper allocation of resources and use of modern technology. The managers should innovate from both the inside-out and outside-in, and they pursue business model innovation. They have to establish capabilities and practices to support an organizational culture of innovation.

Objective Two; relationship between innovation and resilience (Performance Optimization) of Oil and gas companies in Equatorial Guinea

Resulting from the findings on the second hypothesis in the study, the researcher recommends that if resilience is to be improved among the Oil and gas companies in Equatorial Guinea, then; innovation should be more considered in improving and facilitating the working conditions of their employees so as to mitigate circumstances in the work places that could negatively influence their experiences at work specifically in the domain of work attitude.

Objective Three; relationship between diversification and resilience (Adaptive Innovation) of Oil and gas companies in Equatorial Guinea

Resulting from the findings on the third objective of the study, the researcher recommends that if resilience is to be improved to positivity, then the Oil and gas companies in Equatorial Guinea should ensure diversification is highly practiced. The managers should support open forms of innovation, actively encourage new ideas from outside the organization, and embrace open mechanisms like crowdsourcing. This openness is supported by the leaders' engagement of multiple channels to conduct innovation. They need to generate fresh ideas to create new oil and gas products and services by using business platforms and working with oil and gas business partners that can include oilfield and drilling services providers. They also need to team directly with customers to develop new experiences.

5.4 Area for further research

- While the objectives of this study were successfully accomplished, several areas remain unclear and require to be addressed by future researchers; Future research, therefore should consider the relationship between sustainability and protective control of Oil and gas companies in Equatorial Guinea.
- Secondary future studies should consider the inclusion of diversification and performance optimization of Oil and gas companies in Equatorial Guinea, the inclusion of such variables would further enhance the understanding of the factors influencing resilience of Oil and gas companies.
- More research is needed to evaluate the influence of innovation on the performance optimization of Oil and gas companies in Equatorial Guinea.

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APPENDICES

APPENDIX I

Questionnaire on the evaluation of competitive strategies and resilience of the oil and gas companies in Equatorial Guinea

I am **Ntungwe Clovis Ajieh**; a master's student of the Faculty of Business at Uganda Christian University. I am carrying out research on the topic "Competitive Strategies and Resilience of the Oil and Gas Companies: A case study of selected international oil and gas companies operating in Equatorial Guinea". Please answer the following questions based on the practical situation of the industry/enterprise and your own experience. Mark an 'X' and fill the blank spaces where appropriate

SECTION A: Demographic characteristics of Respondents

Kindly indicate by ticking the option that best fits the profile of your Enterprise.

VARIABLES	CATEGORIES
Gender	Male Female
Company age groups	1- 10 years 11 - 20 years Above 21 years and above
Marital status	Single Married Widowed / widower
Educational qualification	Certificate Diploma Bachelor Degree Post graduate
Years in service	New employees (1-9 years) Old employees (10 years and above)

SECTION B: COMPETITIVE STRATEGIES

Please carefully read the respond appropriately with a tick () before each option which corresponds to your choice using the scoring system below

Score	Response mode	Description	Interpretation
1	Strongly disagree	You disagree with no doubt	Very poor
2	Disagree	You disagree with some doubt	Poor
3	Undecided	Neutral	_____
4	Agree	You agree with some doubt	Satisfactory
5	Strongly agree	You agree with no doubt	Very satisfactory

QUESTIONS ON COMPETITIVE STRATEGIES

S/N	COMPETITIVE STRATEGIES	1	2	3	4	5
	Sustainability					
1	From the customer research or customer analysis, your oil company has always identified customer's top wants and needs that they can solve					
2	From the list of customer strengths, this oil company has always found the overlap between strengths they possess that provide value or solve customer needs					
3	This oil company has always applied SWOT analysis to identify the most valuable strengths					
4	This oil company has always axed the strengths their competitors also possess (making the sustainable competitive advantages unique)					
5	This oil company has always identified traits and strengths important to the clients					
	Innovation					
1	Better access to data empowers senior leaders in this oil company to view entire organizational performance in a holistic manner					
2	This oil company has applied Augmented reality (AR) and drone technology to assess and inspect offshore oil rigs					
3	This oil company has applied Lean Six Sigma and this has helped to release their top talent to focus on innovation, product development and operational excellence					

4	This oil company has used Talent with intuition, logic and analytics skills to thrive in the digital competitive environment					
	Diversification					
1	Diversification into new business areas does has given this oil firm an opportunity to significantly increase its profitability					
2	This oil company always wants to exploit potential synergies					
3	This oil company has always diversified through extending the scope of their operations into multiple markets					
4	This oil company's core business is in rise					

SECTION C: RESILIENCE OF OIL AND GAS COMPANIES

Please carefully read the respond appropriately with a tick () before each option which corresponds to your choice using the scoring system below

Score	Response mode	Description	Interpretation
1	Strongly disagree	You disagree with no doubt	Very poor
2	Disagree	You disagree with some doubt	Poor
3	Undecided	Neutral	_____
4	Agree	You agree with some doubt	Satisfactory
5	Strongly agree	You agree with no doubt	Very satisfactory

QUESTIONS ON RESILIENCE

S/N	RESILIENCE OF OIL AND GAS COMPANIES	1	2	3	4	5
	Protective control					
1	This company has always used effective workflows and project management practices to clarify project roles and responsibilities, balance priorities, and move initiatives forward to completion					
2	This company uses a process for stakeholders across the organization to assess the strategic value of new program, project, and partnership opportunities before they commit to them					
3	This oil company regularly assess whether programs and programmatic approaches are effective in accomplishing organization's strategic goals.					
4	This oil company regularly assess whether the overall efforts are generating the positive social outcomes and changes at the center of organizational mission and reason					
	Performance optimization					
1	The company has consistently used effective practices to recruit the right mix of new people in timely ways, welcome them, and equip them for success					
2	The company has reliable operations (administrative, finance, human resources, and technology) systems that are well integrated with programs and support on-site and remote work					

3	This company consistently uses a fair performance management system that includes specific and timely communication about expectations and performance improvement					
4	This oil company uses consistent, transparent practices to document and communicate the titles, roles, responsibilities, accountabilities, salary ranges, and authorities of all staff positions					
	Adaptive innovation					
1	The company has consistently included risk assessment in daily decision-making and broader planning					
2	This oil company consistently uses effective practices to manage consultants and vendors and ensure quality, timely, and cost-effective deliverables					
3	This oil company has sufficient, inclusive, fair, clear, and up-to-date internal policies					
4	When the company needs to allocate significant resources, the managers consistently use an effective process to ensure the need is justified and choice is the best value					

END