UNIVERSITY OF CAPE COAST

EMPIRICAL ANALYSIS OF PETROLEUM REVENUE MANAGEMENT IN GHANA: 2011–2020

GODFRED KWAKU ENNIN

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BY

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DECLARATION

Candidate Declaration

I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in the university or elsewhere.

Candidate's Signature..... Date.....

Name: Godfred Kwaku Ennin

Supervisor's Declaration

I hereby declare that the preparation and presentation of the thesis was supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

Supervisor's Signature..... Date.....

Name: Shafic Suleman (Ph. D)

ABSTRACT

Ghana established the Petroleum Revenue Management Act (PRMA), 2011 (Act 815) as amended as 893 in 2011 after learning from the mistakes made by other resource-rich nations to encourage transparency and accountability in the collection, distribution and management of petroleum revenues in a sustainable manner for the benefit of Ghanaians. After a decade of commercial oil production and the establishment of the PRMA, this study evaluated petroleum revenue management in Ghana thus far by adopting a mixed methodology in collecting and analysing data. A Semi-structured interview guide was employed in the collection of primary data and analysed using thematic analysis. Secondary data were collected and analysed using descriptive statistics and regression analyses. The analysis revealed that between 2011 – 2020, Ghana has received about US$6.55billion and allocated $6.52billion. Again, the Carried and Participating Interest (CAPI) and Royalties have been the two major sources contributing to about 58% and 25% of petroleum revenues respectively. Also, the impact of price variations on petroleum revenues was found to be significant. Additionally, the analysis shows that during the period, petroleum revenue management in Ghana fairly met the expectations, however, there is room for improvement. Based on the findings from the study, it is recommended that the PRMA be reviewed to among others clearly define the priority areas and do away with ministerial discretions on capping the stabilisation fund. This will among others help improve transparency and accountability in the management and use of petroleum revenues in Ghana while ensuring long run sustainability of oil revenues.

KEY WORDS

Benchmark Revenue

Petroleum Revenue

Petroleum Revenue Management

Price Volatilities

Resource Curse

Stakeholder perception

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To my siblings, Evans, Joe, Gloria and Afariwaa, this is for you and it is over to you!

DEDICATION

To Yaw Aniniagyei-Kessey Bernard.

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LIST OF ABREVIATIONS

ABFA	Annual Budgetary Funding Amount
ACEP	African Centre for Energy Policy
CAPI	Carried and Participating Interest
CITA	Corporate Income Tax
CSOs	Civil Society Organisations
GHF	Ghana Heritage Fund
GIIF	Ghana Infrastructure Investment Fund
GNPC	Ghana National Petroleum Corporation
GPF	Ghana Petroleum Fund
GPWF	Ghana Petroleum Wealth Fund
GSF	Ghana Stabilisation Fund
HG	Host Government
IAC	Investment Advisory Committee
IOC	International Oil Companies
NOC	National Oil Company
OPMDAs	Oil Producing Municipal/District Assemblies
PCO	Price of Crude Oil
PHF	Petroleum Holding Fund
PIAC	Public Interest and Accountability Committee
PR	Petroleum Revenue
PRMA	Petroleum Revenue Management Act
VCOL	Volume of Crude Oil Lifted

CHAPTER ONE

INTRODUCTION

The commercial production of petroleum resource in Ghana heightened expectations and inspired hope for a buoyant economy (Plänitz & Kuzu, 2015). The desire to capably harness petroleum revenue in Ghana influenced the passage of the Petroleum Revenue Management Act, 2011 (Act 815 as amended). The purpose of the PRMA was to increase and efficiently manage earnings accruing from the petroleum sector. The introduction of a revenue management model for a resource-rich country such as Ghana is relevant, lest the country experiences the potential effect of the resource curse (Stephens, 2019). The Act was meant to provide fiscal rules in the management and distribution of petroleum revenues in Ghana. A critical review of the sector's performance in terms of revenue management is justified since it will help ascertain the concrete successes and shortfalls while suggesting policy-driven recommendations for efficiency.

Background to the Study

Petroleum resources are neither a curse nor a blessing. Thus, the proficient management of it can make them beneficial or otherwise (Aryeetey & Ackah, 2018). Globally, the petroleum sector is one of the most significant sectors that every nation strives to possess for sustainable development. The position of oil as a transit fuel is critical in the everyday lives of most people throughout the world (Jobling & Jamasb, 2015). From revenue generation to employment creation, hydrocarbons are critical to the development of nations. Since the mid-1950s, oil has become the world's most vital source of energy as the lifeblood of industrialised nations (Ortiz, 2020). The commercial production

of petroleum and other natural resources has been impactful in countries' development and the global economy as a whole.

According to Kuzu and Nantogmah (2010), the exploration and production of petroleum have the potential to either positively or negatively transform the economic structure of a country. This then makes the petroleum revenue management system in an oil-rich country important in scaling-up features such as stabilisation buffers and external savings (Acquah-Andoh et al. 2018). Preventing the resource curse phenomenon and the associated Dutch disease requires a collective effort from government institutions and key industry players. Ghana thus drew inspiration from the experiences of countries such as Norway, Nigeria, Angola and other petroleum resource-rich countries and put together a framework to avoid any potential oil curse (Bawumia & Halland, 2017).

Natural resource utilisation has featured significantly in the economic development strategies of most countries in the pre-colonial, colonial and post-colonial eras. Such prominent fiscal significance of natural resource extraction has been quantified in terms of the contribution of oil, gas, and mining to GDP, exports, foreign direct investment, and the public budget (Bebbington et al. 2018). Certainly, the crucial role of the petroleum sector in economic progress cannot be overemphasised.

In advanced countries, the United Kingdom for example, according to the United Kingdom Oil and Gas (UKOG) Report (2015), about 97% of the energy demands for the transport sector is met by refined petroleum. Additionally, oil plays a key role in the production of many everyday essentials. Refined petroleum products are used to manufacture almost all chemical

products, such as plastics, fertilizers, detergents, paints and even medicines, plus a host of other useful products (Oil and Gas UK, 2015). The successes chalked by some resource-rich countries and the frustrations of other resource-rich nations put into perspective the dichotomy of natural resources in strengthening or weakening an economy.

Effective institutional policy like the Joint Venture (JV) agreement between the Botswanan Government and the De Beers (a diamond mining firm) of South Africa made Botswana a powerhouse in Diamond production in the world in terms of volume and value. The management system in the country catered for the interest of indigenes on whose land, diamonds are exploited through royalties and other benefits. This to a large extent has prevented the internal conflict that characterises natural resource-rich countries over resource ownership. The prudent management of Botswana's natural resources has significantly improved GDP per capita from US$70 at independence in 1966 to US$16,800 in 2012 (Archine, 2013).

Whereas Norway and Botswana showcase the extent to which strategic natural resource management aids in efficient resource exploitation and utilisation, some resource-rich countries, in contrast, are yet to realise the full potential of their natural resource endowments. For instance, Nigeria and Angola, though rich in resources are characterised by the low economic growth rate, corruption and mismanagement of resource earnings. This is fuelled mostly by the absence of transparency and accountability. The unabating conflict in Angola and the Niger Delta in Nigeria over petroleum resources also serves as a barrier to the effective utilisation of the natural resources in these countries. The prevalence of such characteristics in these countries has compelled

researchers such as Sanya and Oloruntuyi (2017) to refer to them as having suffered from the infamous Dutch disease. The successes and failures of the above-mentioned resource-rich countries could serve as a template for emerging oil-rich countries like Ghana to manage their resources. However, blindly copying the strategies of such countries without critical assessment may pose challenges.

The oil and gas sector to a large extent has the potential to drive the development agenda of economies. The demand for oil and gas notwithstanding, the supply of natural resources seems to have increased significantly over the years. Thus, as evident in Rosenberger (2015), "if there is one thing that is certain these days, it is that the world has plenty of oil"(p.1). Petroleum products are the most internationally traded commodities and Stevens (2016) found that in many countries, the petroleum sector contributes significantly to the current account in the balance of payments. Most oil exporters largely depend on oil exports for their foreign exchange earnings.

Since 1970, the search for commercial oil continued for over 3 decades before Ghana discovered petroleum in commercial quantities in 2007 and production began in 2010. Consequently, because of these discoveries, the economic fortunes of the country have seen some facelift in subsequent years. Thus, Amoako-Tuffour and Owusu-Ayim (2010) states that because of its expanding oil and gas sector, Ghana is positioned to be one of the fastest-growing economies in Sub-Saharan Africa. In contrast, however, Bawumia and Halland (2017) confirmed that Ghana did not manage expectations appropriately after the discovery of oil.

Regardless of the challenges that plagued Ghana's attempt to explore, produce and utilise hydrocarbon resources, oil and gas fiscal revenues are projected to be $21 billion from 2015 to 2030, excluding significant revenues already received by the government (The World Bank Group, 2018). Ghana's GDP grew at 6.3% in 2018 compared with 8.1% in 2017. The Oil and Gas subsector GDP was Gh¢ 11,278.5 million in 2017 representing 6.0% of the national GDP and Gh¢ 11,680.4 million in 2018 (Ministry of Finance, 2019). In terms of exports, the Ministry of Finance reported in 2019 that for 2017 and 2018, Crude Oil exports accounted for 22.5% and 30.6% respectively of the total merchandise exports. This emphasises the benefits that accompany oil resource extraction in Ghana.

Nonetheless, Ghana as a budding oil and gas producing country, to date lack adequate domestic technical, capital and manpower to extract its petroleum resources (Suleman & Zaato, 2021). This led to the reliance on the expertise and finance of International Oil Companies (IOCs) to explore and exploit the resource. The dominance of IOCs in the development and extraction of petroleum led to a conscious effort by the Ghana government to develop instruments to ensure indigenous participation in the extraction of petroleum in Ghana.

Ghana's petroleum sector may have chalked some successes amidst some undeniable challenges after a decade of oil production. Indeed, not all countries with abundant resources experience the resource curse and some resource-rich countries have been able to avoid the phenomenon characterised as the resource curse. Norway and Botswana are cited as countries that have been able to turn their resources into significant economic benefit whilst Nigeria

represents a country with evidence of a natural resource curse (Sala-i-Martin & Subramanian, 2003). Thus, Ghana needs to consider adequate petroleum revenue management measures to ameliorate the potential for resource curse whilst ensuring efficient management of this natural resource.

Statement of the Problem

Over the years, petroleum revenues have been sensitive to external shocks and price volatilities (Bacon & Masami, 2008; Fitzgibbon et al. 2015). This represents a source of worry for the government and key players in the industry since a substantial decline in crude oil prices affects government access to revenue and industry profit (Fitzgibbon et al. 2015). The associated instability in government budgets and expenditure can be worrisome and impactful. Such volatilities influence petroleum revenue receipt, and it is, therefore, relevant that a revenue management framework is implemented.

Ghana's Petroleum Revenue Management Act is an ideal framework (Amoateng, 2014) to account for and manage petroleum revenues accruing to the state. However, crude price fluctuations make petroleum revenues volatile (Fitzgibbon et al. 2015) and the rigidity of the Act makes it difficult to respond to the volatilities. According to Gatsi (2012), this is because management of petroleum revenue is variously described as a model and no model is insulated from the challenges that the dynamics of time may bring. Thus, the legal framework that guides the collection and allocation of petroleum revenues in Ghana is defective.

According to Adam (2017), the Petroleum revenue management framework in Ghana, though guided by the legislation, faces critical challenges. Among others, the Act has failed to address revenue volatility and expenditure

smoothing or contributed to overall fiscal sustainability (Suleman & Ennin, 2021). Also, Luki (2016) revealed there are institutional limitations in petroleum revenue management. Meanwhile, it has earlier been established by Thurber et al. (2011) that the major obstacle to oil sector reform is in countries with vigorous political competition but limited institutional capabilities. This therefore weakens the role of the legal/regulatory framework in decreasing expenditure volatility (Gyeyir, 2019). Additionally, the many complexities in implementing and interpreting the PRMA have resulted in deviations from the intent of the Act. Also, the Act has failed to address the discretionary power on the part of the Minister of Finance in terms of capping, withdrawal as well as transfers from the Ghana Stabilisation Fund. This is a challenge because Gyeyir (2019) posits that having discretionary control over resource earnings is detrimental to success, whereas earmarking is beneficial. It suggests that these funds are most effective when they are reasonably rigorous and resistant to political capture.

The problem therefore is that not enough studies have been able to explain why such challenges still persist in the management and use of petroleum revenues in Ghana. Therefore, it is not only timely but relevant to go back to the basics and review the petroleum revenue management framework of Ghana. This will help to understand and realign it with the core principles of the PRMA and to identify and, perhaps, consider its potential reformation and reconsideration.

Objectives of the Study

The study seeks to empirically analyse the outcomes of the Petroleum Revenue Management Act from 2011 to 2020. Specifically, the study seeks to;

i. Assess petroleum revenue collection and allocation framework of Ghana.

ii. Examine how petroleum revenues respond to variations in crude oil prices.

iii. Evaluate the perception of key stakeholders on the performance of the PRMA in Ghana.

Research Questions

i. In what ways are petroleum revenues collected and allocated in Ghana?

ii. How does petroleum revenue respond to Crude Oil Price variations?

iii. How do key stakeholders perceive the performance of the PRMA in terms of the oil and gas sector?

Significance of the Study

The socio-economic gains that accompany petroleum production are enormous. To address the current and future generations' requirements, Acquah-Andoh et al. (2018) are of the view that the benefits generated from these scarce resources must be exploited and utilised sustainably and optimally. As a result, appropriate policies, strategies and programs of action, as well as concerted efforts by the government, institutions, civil society and communities are required. Petroleum revenues paid to the state come from different sources and are also allocated to various state funds and related institutions (PIAC, 2017).

Also, oil as an international commodity is characterised by frequent price fluctuation. These fluctuations consequently affect the revenue sources and allocations. Though Russell and Dawe (2013) find that oil price increases tend to monetarily improve government revenues, the unpredictability of these price swings affects government budget and expenditure (Suleman & Ennin, 2021) as well as planning.

Again, analysis of price variations and its corresponding impact on petroleum revenues will provide the basis as to whether Ghana should hedge against oil price volatilities. Lastly, the stakeholder perspective will help understand the state of petroleum revenue management in Ghana while adding to the stock of academic knowledge. It is expected that the study will influence policy reforms in oil revenue management.

Delimitations of the Study

The first delimitation of the study is that although Ghana started commercial production of petroleum in 2010, initial account on petroleum revenues and how they were collected and disbursed were reported in 2011. This explains why the study purposefully focused on events in petroleum revenue management in Ghana since 2011. Data on petroleum revenues could therefore be sourced from 2011 – 2020 for this study. Also, another delimitation of the study relates to the fact that the oil and gas sector in Ghana is broad in scope such as Upstream, Midstream and Downstream. The study, however, focuses on the upstream and the midstream sector because these streams specifically account for the sources of Government revenues through institutions such as GNPC, BoG, Ministry of Finance and others. The upstream regulations in terms of revenue generation directly or indirectly influence how the resource could be managed and how much revenue accrues to the state. Thirdly, public perception about petroleum revenue management will not include the entire populace but rather, a section of it who are considered to have in-depth knowledge about the operations and performance of the oil and gas sector concerning petroleum revenue management. This section of the populace will be key stakeholders in the category of Civil Society Organisations (such as

ACEP and GIZ Ghana), Government Agencies and Institutions (such as the Ministry of Finance, GNPC, PIAC, Bank of Ghana) and others.

Limitations of the Study

The study will analyse data from various sources and over different timelines. The secondary data collected from various sources may have been collected using different methodologies and that might affect the accuracy of the data analysed. Also, data collected over a period may have changed. However, the various secondary sources may not consider these changes and as a result, the study faces some potential data inconsistences because the data collected will not be the same across the different periods.

Definition of Terms

i. **Petroleum Revenue**: *This, according to the PRMA sections 6 and 7 refers to petroleum revenues or receipts as Royalties from oil and gas, additional oil entitlements, surface rentals, other receipts from any petroleum operations and from the sale or export of petroleum.*

ii. **Benchmark Revenue**: *The sum of the expected revenue from crude oil, gas royalties and dividends from the National Oil Company.*

iii. **Petroleum Revenue Management**: *The efficient collection, allocation and management of petroleum revenues in a responsible, accountable and sustainable manner.*

iv. **Participation**: *The practice of involving affected individuals and interested parties in an open conversation that allows a variety of viewpoints to be voiced to inform decision-making and develop an agreement. Consultation should be done in a way that is appropriate for*

the community, such as by distributing information in local languages ahead of time (Luki, 2016).

v. **Resource Curse**: *The situation whereby a country rich in natural resources fails to develop relative to resource-poor countries.*

vi. **Dutch Disease**: *A condition that arises when a country's discovery of a natural resource leads to the collapse of other sectors of the economy.*

vii. **Rent-Seeking**: *The process in which individuals/agencies earn income/revenues via unproductive activities through corruption but not limited to misappropriation of funds, theft and embezzlement.*

viii. **Institutions:** *These are the rules, regulations and policies with the tendency to influence how petroleum revenues are collected, allocated and managed or used.*

Organisation of the Study

This study is organised into five chapters. The first chapter introduced the research which dealt with the background to the study, problem statement, research objectives and questions, significance, delimitations and limitations of the study, definition of terms used and the organisation of the study. In chapter two, the focus was on literature review which involves a theoretical and conceptual framework that put the research into scope and perspective. Chapter three emphasised the methodology used in the study. In chapter four, data were collected, analysed and discussed. In chapter five, the attention was on the findings, summaries and conclusions. The study also offered some form of recommendations for the sake of policy considerations.

CHAPTER TWO

LITERATURE REVIEW

Introduction

This section will provide a review of existing academic information on the topic under study by considering the literature on theories and concepts of petroleum revenue management. The relevance of this activity is that among others, it will help situate this study by bringing to light the debates and historical antecedents that confirm the need for a petroleum management framework and tease out issues in the management of petroleum revenues in developing countries especially Ghana. Also, the literature review will point to gaps in the literature that need attention and bridging. Lastly, it will provide education on what Ghana's petroleum revenue management model is and how it is expected to help collect and disburse petroleum revenues that accrue to the State.

The Petroleum Revenue Management Act (PRMA) of Ghana

A study by Dah and Sulemana (2010) agrees with the notion that petroleum resources may bring a country a lot of investment and prosperity, but if not carefully managed, they can also bring a lot of damage and violence. Any country that is sensitive to revenue mobilisation and optimisation of petroleum earnings, therefore, takes calculated steps to ensure that the oil revenue is a blessing rather than a curse. Petroleum revenues, as influenced by price fluctuations is synonymous with business cycles (Aryeetey & Ackah, 2018). As a result, managing windfalls and bursts has become an inevitable feature of natural resource endowed countries that seek to maximise petroleum earnings. Ghana's passage of the Petroleum Revenue Act (815) in 2011 as amended as

Act (893) in 2015 could be considered the first step in mitigating potential shocks to Ghana's petroleum revenues.

The management of Ghana's petroleum revenues is guided by Petroleum Revenue Management Act (2011) (Act 815) and the Amendment Act, 2015 (Act 893) (Gyeyir, 2019). The Petroleum Revenue Management Act, 2011 (Act 815) also known as 'PRMA', was enacted to regulate the utilisation of petroleum revenue in Ghana in 2010. Gyampo (2016) is of the view that PRMA offers the legal background against which petroleum revenues are collected, allocated and managed in a responsible, transparent, accountable and sustainable manner for the benefit of the citizens of Ghana. According to Stephens (2019), Ghana enacted the PRMA, with the goal of, among other things, keeping track of how petroleum revenue is used.

The model is made up of a Petroleum Holding Fund (PHF) at the Bank of Ghana which receives all petroleum revenues including but not limited to the Government's participating interest, taxes and royalties. Distributions are made from the PHF into three principal funds namely The Ghana National Petroleum Corporation (GNPC), The Annual Budget Funding Amount (ABFA) and The Ghana Petroleum Funds (GPF). From these principal Funds, allocations/withdrawals are further made to other specific accounts for stipulated purposes per the dictates of the Act. Figure 1 graphically represents Ghana's PRMA framework with its components as explained.

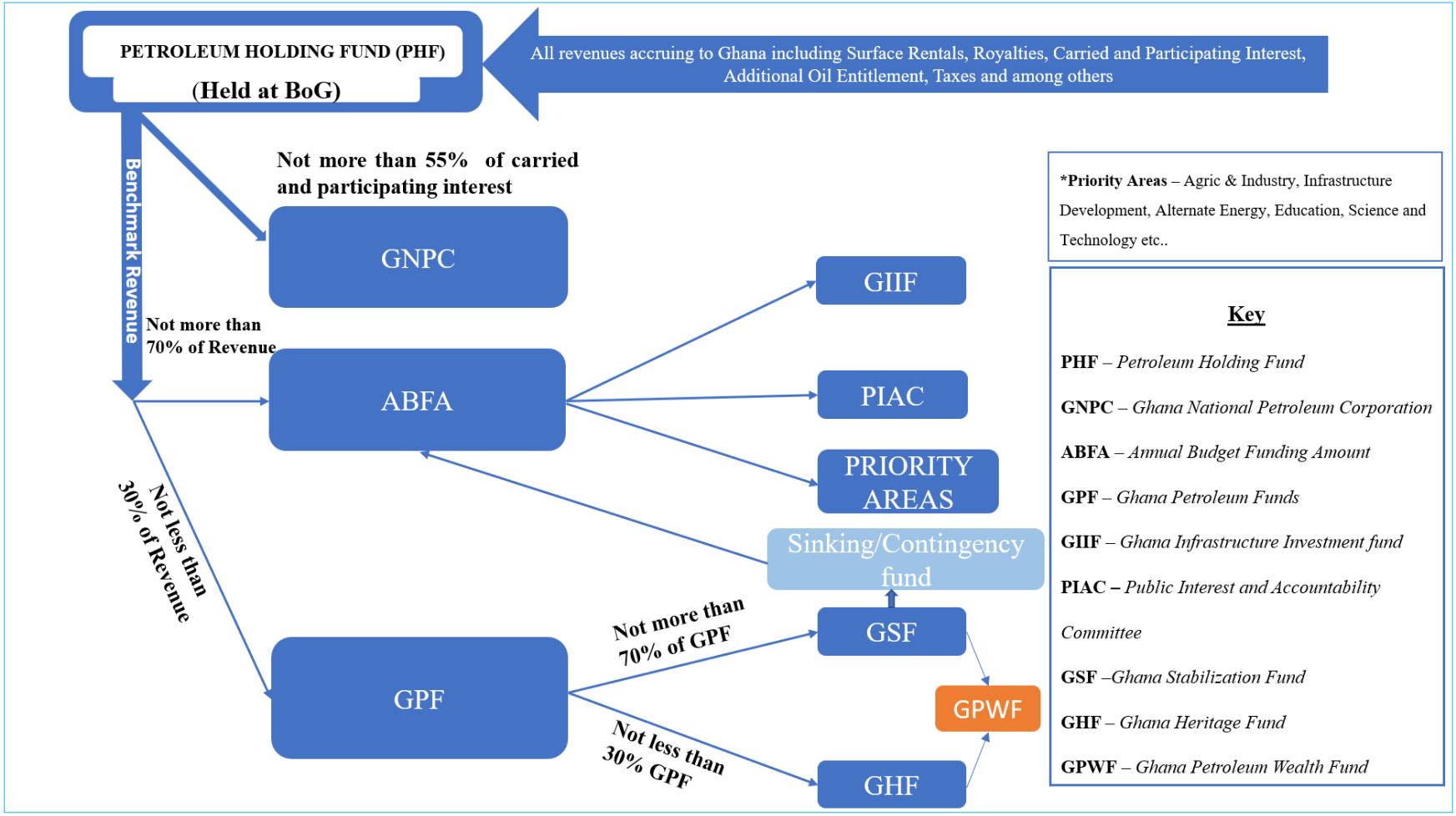


Figure 1: Petroleum Revenue Management Framework of Ghana

Source: Author's construct based on the PRMA (815 & 893)

The Petroleum Holding Fund (PHF)

This is a Bank of Ghana-designated public fund that collects and disburses petroleum revenues. Sources of petroleum revenues in Ghana mainly include Surface Rentals, Additional Interest, Carried Interest, Additional Oil Entitlements, Corporate Income Taxes and Royalties as stipulated by the PRMA (Graham et al. 2020). These sources, however, vary depending on the country based on the petroleum arrangement between the industry stakeholders. The PHF simply 'holds' petroleum revenues from these sources for further disbursement.

Thus, all allocations and disbursements are made from the Fund. In some instances (PIAC, 2017), the government prefers to be paid in petroleum instead of in cash. In this case, because petroleum prices change daily, the Ghana Revenue Authority (GRA) is required to record and analyse the worth of the petroleum received by the government on a precise day received. It is also required that the proceeds from the sale of the petroleum obtained to be paid into the PHF within 60 calendar days of receipt.

Ghana National Petroleum Corporation Allocations

The GNPC, as established in 1983 by the PNDC Law 64, is the National Oil Company for Ghana and as a result represents the state/government in all upstream petroleum agreements/contracts/activities (The GNPC Law, 1983). According to Article 2, clause 2 (a & b) of the law, the objectives of the corporation are not limited to;

a. promote the exploration and the orderly and planned development of the petroleum resources of Ghana.

b. ensure that Ghana obtains the greatest possible benefits from the

development of its petroleum resources.

The operations of GNPC are approved by Parliament and financed mainly from the PHF where not more than 55% of the carried and participating interest goes to GNPC after the deduction of equity financing costs. This is the profit share that the government receives as a result of its ownership stake in the oil industry (Graham et al. 2020). An additional source of funds comes from the sale of geo-seismic data to IOCs. Payment to a National Oil Company – GNPC – which represents the state, is provided for in the PRMA. The GNPC's interest is technically Ghana's interest. Payments from the PHF to the GNPC will be used to fund the company's operations related to the petroleum agreements in which it has a stake. Every three years, the transfer is subject to a legislative review.

Annual Budgetary Fund Amount (ABFA)

Regarding the PRMA, ABFA from the petroleum revenue shall not be more than 70% of the Benchmark Revenue. The ABFA is a component of the national budget, and its usage and expenditure are subject to the same budgeting processes that assure efficient allocation, responsible use, and effective expenditure monitoring. The PRMA also stipulates that the ABFA be used as collateral for debts and other liabilities of the Government for not more than ten years after the commencement of the Act. Revenues accruing to the ABFA is further distributed between the Priority Areas, the Ghana Infrastructure Investment Fund (GIIF) and the Public Interest and Accountability Committee (PIAC).

Priority Areas

Section 21 subsection 3 of the PRMA makes provision for situations "where the long-term national development plan approved by parliament is not

in place, the spending of petroleum revenue within the budget shall give priority to, but not limited to program of activities relating to" 12 key priority areas including but not limited to agriculture and industry; portable water delivery and sanitation, public safety and security, physical infrastructure and service delivery in education, science and technology.

The government must however not prioritise more than four (4) areas when submitting the outline of activities for the use of the petroleum revenue. This will ensure that the government tackles the most 'important' areas of the economy to avoid ineffective use of the fund.

Ghana Infrastructure Investment Funds (GIIF)

Out of the about 70% allocations to the ABFA, a minimum of 25% is allocated for public investments expenditure which is aligned with an infrastructure developmental objective and shall be included in the national budget. It is important to note that this component of the model was added after the PRMA was amended in 2015.

Public Interest and Accountability Committee (PIAC)

The establishment of PIAC to oversee the collection, allocation, and utilisation of petroleum revenue and the mandatory publication of information on licenses and revenue reflects Ghana's quest for good governance in the petroleum sector (Sefa-Nyarko et al. 2021).

Specifically, the role of PIAC as evident in PIAC (2019), is to; monitor and evaluate compliance with the Act by government and relevant institutions. PIAC also provides space and platform for the public to debate whether spending prospects and management and use of revenues conform to development priorities as provided under section 21 of the PRMA. Lastly, the

committee provides an independent assessment of the management and use of petroleum revenues to assist Parliament and the Executive in the oversight and performance of related functions.

Following the amendment of the PRMA in 2015, PIAC receives 5% of the ABFA allocations to finance its operations.

Ghana Petroleum Funds (GPF)

The Petroleum Fund is a distinct investment established by a government for macroeconomic and investment objectives (Abraham, 2019). Revenues allocated to the Ghana Petroleum Funds are shared between the Ghana Stabilisation Fund (GSF) and the Ghana Heritage Fund (GHF). The two are mechanisms through which surplus petroleum revenues are deposited for savings and investments. The PRMA requires that not less than 30% of the benchmark revenue in any year be paid into the Ghana Petroleum Funds. Out of this, allocations to the GSF and the GHF are made.

Ghana Stabilisation Fund (GSF)

The stabilisation fund is a fiscal instrument that saves and sets aside a fixed amount of money if it is needed for economic stability in the future. They might also be government accounts set up to level out public spending and consumption by putting money aside during periods of rapid growth that can later be used during periods of economic recession (Gyeyir, 2019). The major elements of a stabilisation fund, according to Bagattini (2011) are the fund's purpose, the source of revenues, the rules governing how revenues flow into and out of the fund, the fund's relationship to the budget, the structures and institutions in charge of managing its operations, including their degree of discretion, and the use and size of the fund's resources. When commodities

markets crash and natural resource income fall, stabilisation funds provide a financial cushion. It is designed to cushion oil-price fluctuations (AlKathiri et al. 2020). While stabilisation funds contribute to minimising volatility by smoothing out government revenue, they should not be expected to function and achieve their policy objectives in isolation (OECD, 2018).

The PRMA establishes the GSF's macro-fiscal objectives: to mitigate or maintain governmental expenditure capacity during periods of unexpected petroleum income deficits (Gyeyir, 2019). It receives not more than 70% of the GPF. The PRMA's principal objectives for this fund are to reduce the negative impact of oil income volatility on the national budget while maintaining public expenditure capacity in the event of an unforeseen revenue deficit. If quarterly oil receipts do not cover 25% of the yearly budget financing amount, funds are withdrawn to sustain the budget. According to the PRMA, a quarter's deficit is compensated by the lesser of 75% of the expected shortfall for the quarter or 25% of the fund balance (Natural Resource Funds, 2013).

When there are unexpected internal and external shocks that negatively affect petroleum revenues, through the advice and recommendation of the parliament of Ghana, a decision is made to fall on the stabilisation fund to 'resuscitate' the economy. The PRMA additionally stipulates that the GSF can be capped at a level decided by the Minister of Finance, with any remaining funds being transferred to the Sinking Fund/Debt Service Account and the Contingency Fund (Gyeyir, 2019).

In 2016, during the mid-year budget review, the Minister of Finance announced that the Ghana Stabilisation Fund's ceiling had been decreased to US$100 million from US$150 million, down from an initial cap of US$250

million (PIAC, 2017). The excess of the cap is sent to the sinking (for debt repayment) and contingency funds and interest earned from this funds are deposited to the ABFA. The PRMA states that the Ghana Stabilisation Fund's accumulated revenues must not exceed a sum suggested by the Minister and authorised by Parliament. This sum will be reassessed regularly as macroeconomic conditions dictate.

Ghana Heritage Fund (GHF)

The PRMA specifies that a minimum amount of 30% of the GPF be deposited into the Heritage Fund (Graham et al. 2020). Accordingly, this fund is established to serve as an inheritance to aid the development of future generations when Ghana's petroleum reserves have been depleted. In most cases, it is considered an endowment to support the development of the unborn generation. According to PIAC (2017), the funds are invested in secure assets outside of Ghana, with modest yields because they are low-risk investments. Investment-grade bonds and convertible currency deposits issued by sovereign nations, central banks, and multilateral institutions such as the Bank for International Settlements are among the eligible instruments. Ackah et al. (2020) acknowledged that withdrawals from the GHF are expected to be made only when the resource is depleted; but, after fifteen years, parliament can change the fund's rules by a resolution.

The Ghana Petroleum Wealth Fund (GPWF)

The funds held in both the Ghana Stabilisation Fund and the Ghana Heritage Fund shall be combined into a single Fund, to be known as the Ghana Petroleum Wealth Fund (GPWF), within one year after petroleum reserves have been depleted. Following that, the Annual Budget Funding Amount shall not exceed

the Fund's profits plus the total of GNPC dividends (Stephens, 2019). It focuses on generating a sustainable source of income in the long run (AlKathiri et al. 2020).

Investment Committee (IC)

The PRMA creates an Investment Advisory Committee to advise the Minister on the management of the Ghana Petroleum Fund's overall performance. Its responsibilities include formulating and proposing investment policies and management of the Funds to the Minister. The Committee is made up of seven (7) members nominated by the Minister of Finance in conjunction with the Governor of the Bank of Ghana and appointed by the President. At least two of them must be women, and they must have demonstrated expertise in finance, investing, economics, business management, law, or other related fields. The PRMA enjoins the government to invest the Sovereign Funds (GSF and GHF) in qualifying instruments as may be advised by an Investment Advisory Committee (IAC).

Sources of Petroleum Revenue to the Government

Generally, Petroleum revenues come from two main sources known as (1) Activity Related and (2) Non-Activity Related Sources. The Activity Related Sources, also called resource rents, according to PIAC, represent the value of a petroleum resource less all the necessary production costs. On the other hand, the Non-Activity Related Sources are taxing methods that apply to the industry as a whole. It is worth noting that such sources of petroleum revenues are largely influenced by government tax policy and external factors including oil prices (PIAC, 2017). The fiscal regime(s) of Ghana set the stage for streams of income to be generated from the oil and gas sector.

Carried and Participating Interest (CAPI)

The term "carried interest" in the oil sector refers to government involvement in the field's exploration and development. The IOC bears the government's exploration costs, and upon commercial discovery, the government receives a part of the exploration costs (Samanhyia & Samanhyia, 2016). The participation interest, also known as the working interest, is the share of exploration and production costs that each party will incur, as well as the share of production that each party will get, as specified in an operating agreement (Schlumberger, 2020).

Royalties

These are payments given by one party to another who owns a certain property in exchange for the right to utilise that asset continuously. It is considered as a proportion of gross production, or the gross value derived from production. Royalties have for a long time been one of the most common avenues through which the Host Governments (HG) gain access to early revenue from the production of a country's natural resources. It is usually based on either the volume or the value of production. They are attractive to government due to their ability to ensure an upfront revenue inflow once production commences. Royalties are a regressive form of levy and to mitigate the potential distortions in investment decisions, some governments levy royalties on a sliding scale depending on output levels or selling prices, water depth or well depths, or R-factors (Tordo, 2007). Royalties are pegged at 12.5% in the Model Petroleum Agreement (MPA) of Ghana but are subject to negotiations. They are levied on gross production regardless of levels of

profitability and Ghana's fiscal regime makes room for royalties to be taken in cash or in-kind (Amoateng, 2014).

Additional Oil Entitlements (AOEs)

According to Amoako-Tuffour and Owusu-Ayim (2010), if a project's post-tax rate of return exceeds a set threshold, an extra contribution to the government is required. It determines a country's right to crude oil and serves as a windfall tax (PWC, 2017).

Additional Interest

Unlike the carried interest, the additional interest gives the government the right to opt for an additional interest, which is a working interest. It aims at increasing the benefits to the state but it comes with a cost. To be eligible for the extra interest, the government has the power to pay a proportional amount of the development and production costs (Samanhyia & Samanhyia, 2016).

Corporate Income Tax (CITA)

Companies and organisations producing in a country are expected to make some form of payment to the HG in the form of taxes. The government's administrative burden is expected to be reduced. In most cases, CITA is well enshrined in a country's taxation policy(ies). According to Nakhle (2008), this form of taxation is important to the HG due to its neutrality and progressiveness in their operation as they target rents and profit. In effect, the contractor's share of the profit oil is subject to taxation by government (Anthony, 2013). According to Tordo (2007), the degree of taxes is connected to characteristics such as the level of activity or the price of crude oil/gas in a progressive income tax, allowing the HG to share in the project's benefits when economic conditions are more favourable.

Surface Rentals

Surface rentals, according to Adam (2014) do not account for a major portion of petroleum revenues in Ghana but Samanhyia and Samanhyia (2016) specifies that the payment of yearly rental costs per square kilometre of the area remaining at the commencement of each contract year as part of the contract area is made possible by surface rental. Thus, it adds up to the revenue that the HG generates from the oil and gas sector.

Table 1 gives a summary of the various petroleum revenue sources that accrue to the Government of Ghana as contained in a document by the Public Interest and Accountability Committee in 2017.

Table 1: Sources of Petroleum Revenue to the Government of Ghana

SOURCE OF REVENUE	EXPLANATION	% REVENUE
Carried and Participating Interest	In most petroleum agreements, the State is 'carried' by the IOC, which means that the GNPC/State does not pay anything for exploration and development costs. When oil production begins, the state, on the other hand, pays its portion of the costs.	All petroleum agreements had a minimum of 10% carried interest to the state prior to the implementation of the Petroleum Act of 2016. This was increased to 15% carried interest following the Act's implementation.
Royalty	Oil corporations pay royalties to the government, which owns the mineral rights. The State, as the resource's owner, is entitled to a portion of the entire production before any deductions are made. The state has the option of accepting the royalty in cash or in kind (oil), and in the past, the state has preferred to accept it in kind. When the state chooses payment in kind, the Ghana Revenue Authority reports and records the worth of the oil in US dollars on the day it is received as payment to the state.	Royalties in Ghana have ranged from 5 to 12.5 percent of total gross production (depending on the specific petroleum agreement).
Additional interest	If a commercial discovery is made, Ghana has the option of raising its ownership in the area within a certain time frame after the discovery is declared. If it decides to use the option, the maximum percentage is contractually agreed upon in the parties' petroleum agreement. If the State/GNPC decides to expand its investment, it pays for all expenditures from that point on, including development and production costs.	Based on current petroleum agreements additional interest has been no more than 25%.
Corporate income tax	This is a tax on oil and gas firms' earnings. The Petroleum Income Tax Act specifies a 50 percent tax rate, however it also states that a petroleum agreement might provide a different rate.	All existing petroleum agreements have an effective corporate income tax rate o 35 percent due to a clause that permits the State to alter the stated 50 percent rate.
Additional oil entitlement	Once profitability exceeds certain agreed-upon rate-of-return levels, the State is entitled to an additional percentage of the IOC's share of crude oil on each individual field.	So far, the government has taken a maximum of 30% in the agreements entered.
Surface rentals	Surface rentals are yearly rents paid by IOCs to the government in exchange for the right to explore for oil and gas on the sea or on land. The licensees in the area are paid in USD per square kilometre of territory they operate.	
Other receipts	(1) Capital Gains Tax: This is applied when an IOC sells its petroleum assets and realizes a profit. Tax is charged on that profit. (2) Dividends: Refers to monies paid regularly (typically annually) by GNPC to the State out of its profits	

Source: (PIAC, 2017)

Natural Resource Revenue Management: Challenges and Constraints

Civil unrest, corruption, misappropriation of funds, rent-seeking are but a few of the threats that natural resource-rich countries come up against. In most cases, the internal structures within the natural resource endowed nation could help combat such threats. However, in a broader spectrum, the revenue-generating potential of a natural resource rich country is hindered in several ways some of which are external to the country's structures. In dealing with such challenges, more robust, strategic and broader consultations have to be put in place to realise the optimal benefit of the natural resource.

According to Berg et al. (2013), natural resource income can help capital-strapped economies overcome financial and budgetary limitations and boost economic development. However, because these revenues are finite and fluctuating, they offer considerable problems to policymakers. Similarly, Cameron and Stanley (2017) highlighted four principal challenges that confront natural resource revenue management two of which were identified by Berg et al. (2013). These challenges are (1) Uncertainty and Volatility, (2) Exhaustibility, (3) Undetermined Ownership and (4) Absorptive Capacity. The following paragraphs provide an insight into these challenges as they impact the revenue-generating capacity of a developing resource-rich country.

Uncertainty and Price Volatility

The abundance of resources is a blessing, but the price volatility of those resources is a curse (Luciani, 2011). An economy's inability to predict what might happen ahead of time is perhaps one of the most difficult aspects of managing a resource and thus it is considerably more difficult to forecast pricing than it is to forecast production volume (Inkpen & Moffett, 2011). Available evidence in the literature (Bacon & Masami, 2008) points to the claim that since

the significant price hikes in the 1970s and 1980s, oil prices have been volatile. The market price of oil, therefore, has historically experienced extreme volatility (Inkpen & Moffett, 2011). Crude oil resources, like any other commodities such as Gold, Diamond, Bauxite and the rest, are influenced by the fluctuations of the business cycle and it behaves accordingly. The uncertainty as to what might be the direction of crude oil prices presents a source of worry to oil dependent developing nations.

The problem is well captured by Cameron and Stanley (2017) that the volatility and uncertainty of resource receipts hamper any revenue management rule design, affecting resource wealth estimations as well as the government's cash flow. The challenges presented by uncertainty and volatility are further escalated by poor records of price forecast and by the blurry nature of information on future prices. The uncertainty and volatility of oil revenue, as evident in IMF (2003) challenges macroeconomic management and fiscal planning—the problem being to prevent channelling oil price volatility into the macroeconomy, which is beyond policymakers' control.

Bacon and Masami (2008) addressed how countries could cope with volatilities. It goes on to suggest that attempts at stabilising oil prices would not be successful when oil price volatility appears to grow without bound and cautioned that smoothing oil price fluctuations should be approached with care.

The issues that uncertainty and volatilities pose to a resource-dependent country are enormous. While advancing his arguments, Fattouh (2010) recognised three threats of a volatile environment to oil exporters. According to him, a volatile environment; (1) is a recipe for short term price swings and volatilities in the development of domestic economies, (2) poses another

challenge in terms of the decision to invest in new capacity amidst uncertainties and (3) a long-term challenge related to potential risk on oil demand.

When it comes to the link between crude oil production and crude oil prices, Ye et al. (2006) concluded that lower crude oil production levels pile up pressure on crude oil prices. The negative relationship, however, according to Oberholzer (2017) does not indicate a declining relevance of crude oil.

It is evident, from the literature that price volatilities and uncertainties continue to hamper growth and development in developing countries. Oil-rich developing countries mostly in Africa depend on oil revenue for their budgetary planning. Booms and bust have been found to follow the business cycle and as a result, the unlikely event of international crude price declines may have a significant impact on national budget. Such a challenge makes revenue generation highly unpredictable (Gyeyir, 2019). This is because Governments, organisations and individuals face a range of planning issues as a result of oil price volatility and unpredictability (Raimi et al. 2019).

Exhaustibility

Exhaustibility is a key distinguishing feature between natural resources and other types of traded commodities. Exhaustible/finite/non-renewable resources exist in finite quantities and as a result, they do not develop or replenish themselves over time. By extension, every unit of an exhaustible resource used today decreases the amount accessible for future use. Although the term "exhaustible" is sometimes used interchangeably with "non-renewable", it is important to note that renewable resources can also be exhausted if they are over-exploited (World Trade Organisation, 2010). Responsible management of natural resource income may provide a country with riches, economic growth, and stability, but these revenues are finite, among

other things according to Ali-Nakyea et al. (2019), however, are a challenge to policy. Findings from Berg et al. (2013) also confirm that managing revenues from non-renewable resources poses challenges for policymakers.

Additionally, the world economy is assumed to crash into the barrier of resource exhaustion and scepticism regarding energy depletion particularly peak oil and materials have heightened over the years (Capellán-Pérez et al. 2014). Oil as a strategic commodity is exhaustible among other special features. Such a feature, according to Ackah and Kankam (2014), must be considered in any fiscal system. A nation with significant exhaustible resources, such as oil, might gain a lot from them, but the cash generated from their extraction can be difficult to manage (IMF, 2003) since exhaustible resources may be non-existent in the future. In their analysis of the fluctuations in Ghana's oil economy, Aryeetey and Ackah (2018) were emphatic that oil resources are non-renewable and, given enough time and technology, will run out.

Also, the exhaustibility of natural resource revenues generates medium-term concerns about how to maintain capital accumulated when there is a boom (Berg et al. 2013). As stated above, oil as a non-renewable natural resource depletes as production goes on. This situation will eventually result in a reduction in government revenue inflows (Ali-Nakyea et al. 2019). Oil production income is only transitory, and their longevity is determined by the quantity of reserves, the pace of extraction, and future oil prices (World Bank Group, 2006). Hence, revenue is temporary and its sources exhaustible because it comes from the transformation of a non-renewable asset (Roe et al. 2017) and also poses significant concerns of sustainability and resource allocation between generations (IMF, 2003). The availability of non-renewable sources of revenue may thus motivate the government to adopt a longer perspective of the

use of oil earnings, ensuring that they continue to deliver benefits after the resource has been depleted (World Bank Group, 2006).

Undetermined Ownership

When it comes to natural resource ownership, the argument has been that no one has a stronger claim to their ownership or usage than the other (Risse, 2012). Accordingly, natural resources do not come into the world already 'connected' to certain individuals, unlike the objects we produce through our labour (Armstrong, 2019). Natural resources deposit within the geographic boundaries of a country is legally an asset/property to the country in question. The problem however arises when the rightful owners of the resources are to be determined within a country. In most cases, resources belong to the state but which group of people have control of it? Does it belong to the indigenes on whose land the resource is discovered? Does it belong to the politicians and lawmakers who prescribe and make regulations regarding how such resources should be exploited, utilised and managed? Is the resource for the present or future generation? What does it mean to say the resource belongs to the people of a country, which people are we referring to in this context? (Cameron & Stanley, 2017).

The difficulty in defining the category of people that owns a natural resource has daring consequences on natural resource revenues and the problem becomes a recipe for conflict and civil unrest in some jurisdictions. The challenge, according to Aggarwal and Elbow (2006) is that controlling or gaining access to land and natural resources is critical for long-term management and effective governance as well as empowerment of the rural folks on whose land natural resources are exploited.

Absorptive Capacity

The ability of an economy to respond to a natural resource windfall is an important factor in stimulating growth and development for a natural resource-rich country. An early commentator on the concept, Kim (1995) is of the view that absorptive capacity aids in assimilation, usage, adaptation and change of existing technologies. Sustaining the gains from the exploitation of a natural resource is crucial to an economy. Berg et al. (2013) supports that sustainable investment decouples recurring government expenditure from resource revenue flows, protecting the domestic economy from the volatility of resource revenues.

Various scholars (Serafy,1981; Kim,1995; Khordagui & Saleh, 2013; Harris & Yan, 2016; Dzhengiz & Niesten, 2019) have written extensively on the concept of absorptive capacity, many of which were adapted to meet a specific purpose in the respective disciplines of these authors. Serafy (1981) opined that the notion of absorptive capacity has a lot to do with absorption rather than absorptive capacity. He expanded his argument by relating the absorptive capacity of an economy to its ability to absorb capital production.

A natural resource-rich nation could benefit from a short-term windfall. However, a response to the growing capital inflows and technologies as well as the earnings from the natural resource sector sometimes becomes a nightmare for some natural resource-dependent countries. The inadequate capacity of the economy to expand and absorb the various inflows to a large extent is a challenge to revenue sustainability in the Extractive Industry (EI). Decisions regarding whether to invest in domestic capital or save in a sovereign wealth fund are based on the economy's absorptive capacity as well as the return on capital (Berg et al. 2013). While it may be desirable to devote a significant

portion of Extractive Industry sector revenues to spending, particularly domestic investment, the impact of that spending will be largely determined by the resource-rich economy's absorption capacity and the government's institutional framework (Cameron & Stanley, 2017).

Theoretical Framework

The section provides the theoretical bases of the study. This helps put the study into perspective and aid in situating the study in academic literature. There are numerous theories insofar as natural resources are concerned. However, petroleum resources unlike others have unique features that make them distinct. It is unique because it is a non-renewable resource and also traded in a volatile global market. It is therefore important to use a well hypothesised theory that best connects natural resource extraction and sustainable resource management to explain it. As a result, this study is built on the theoretical formulations of the resource curse phenomenon.

The Resource Curse and Related Concepts

It is well-known that developing countries with access to more resources fare less well economically than those with less access to resources (Acheampong & Akumperigya, 2018). According to Larsen (2006), the term resource curse describes the phenomenon in which resource-rich nations grow more slowly than equivalent, non-resource-rich countries based on aggregate production per capita. Frankel (2010) points out how frequently countries with oil or other natural resource richness have failed to expand at a faster rate than those without.

The roots of the resource curse could be traced to the writings of Richard Auty who coined the term in the 1990s. According to him, the resource-curse phenomenon ‘is not an iron law, rather, it is a strong recurrent tendency’

(Auty,1995). The term has since been developed by many concerned writers including Brahmbhatt et al. (2010) who agreed with earlier postulations by Jeffery Sachs and Andrew Werner that natural resource abundance has a strong negative impact on growth. The debate as to how natural resource is or could be a curse continues to dominate current discussions in the extractive sector and oil and gas is not an exemption.

To begin with, for most countries, the abundance of natural resources results in economic stagnation, waste and corruption which are sometimes credited to the resource curse (Roe et al. 2017). However, Cust and Vézina (2019) provide a rather contrasting view that resource booms are a blessing than a curse.

In a broader perspective, the resource curse has been looked at from diverse socio-economic perspectives lately to better understand it and appreciate the phenomenon in question. The question of whether natural resource richness is a curse or a benefit is still heavily debated among economists (Cust & Vézina, 2019). The divergent economic explanations for the resource curse have received much attention in recent times. Evidence from Bebbington et al. (2018) suggests that the link between resource dependency and national economic and social performance does not follow any discernible pattern.

On the contrary, Harvey (2019) finds that mineral and hydrocarbon abundance appears to be strongly correlated with under-development. Findings from Ushie (2013) also suggest that indeed an abundance of natural resources is usually connected with bad economic and political consequences. This brings to light the challenge of arriving at a universal definition of what the resource curse is. This is so because the specific causes of the oil curse are difficult to

pinpoint because each country's experience with oil and gas is unique (Inkpen & Moffett, 2011). Okonkwo (2017) describes the socio-economic part of the natural resource curse as a curse on the people since inhabitants continue to live in abject poverty with little or no progress.

As evident in literature (Kuzu & Nantogmah, 2010; Torres et al. 2012; Kaznacheev, 2013; Stevens, 2015), the presence of bountiful natural resources alone is not a recipe for the so-called resource curse. This suggests that other factors may also contribute to the woes of the resource-rich country. In the absence of a definitive explanation of the resource curse phenomenon, several scholars including Tornell and Lane (1999); Barder (2006); Frankel (2010); and Stevens (2015), have identified some concepts about the resource curse theory to better understand it. For the purpose of the study, concepts such as the Dutch Disease, Rent-Seeking, Institution Theory, and Permanent Income Hypothesis (PIH) were advanced. The following paragraphs throw more light on these concepts as they apply to the natural resource curse discourse.

The Dutch Disease

To situate the concept economically, the Dutch disease has been considered as the detrimental consequences that natural-resource windfalls and associated exchange rate appreciations may have on the rest of the economy (Di John, 2010). One of the dangers of oil booms, for instance, is that higher exchange rates make non-oil-tradeable businesses like manufacturing less competitive, leading to de-industrialisation (Barder, 2006). Defined explicitly, Stevens (2015) considers the Dutch disease as a contraction in the non-hydrocarbon traded sector after a real appreciation of the currency rate. This resulted in a drop in manufacturing in the Netherlands.

According to Frankel (2010), the Dutch disease can be caused by factors other than a spike in commodity prices. Other causes of the Dutch disease include commodity booms caused by new reserves being discovered or other expansions in supply, resulting in a trade surplus through exports or a capital account surplus through inbound investment to develop the new resource. Specifically, Krugman (1987) posits that when a nation has a resource boom as a consequence of marketable resource discovery and/or a rise in resource price, it usually sees a real appreciation of its exchange rate as well as a movement of some of its labour force to the resource sector as a result of higher wages. Akylbekova (2015) affirms that because of high prices and a lack of export promotion, natural resource-rich countries frequently fail to pursue export-led growth.

Afful-Koomson and Asubonteng (2015) are of the view that the resource curse's economic mechanism is quite well understood. However, they attribute the relative price effect to such mechanisms and explain that the process by which the increasing value of the local currency makes imports cheaper and export more difficult. Another mechanism, according to them is the volatility of petroleum prices, which lower investments and create uncertainty in other production sectors. In all, they emphasised that resource-cursed countries are characterised by over-investment in the extractive sector and under-investment in alternative production.

Although the Dutch disease was fairly good enough to explain the resource curse mechanism, it failed to explain the extreme case where countries like Norway, Botswana, Australia and other natural resource-rich countries managed to escape the resource curse. From this premise, the notion that other conditions must be present in a resource-rich country for the resource curse to

manifest was birthed. This was the grounds on which the rent-seeking theorists built their ideas.

Rent-Seeking Theory

In a well-functioning economy, regardless of the economic system, it is expected that resources are efficiently allocated either in the name of profit-making (as with the private sector) and/or satisfying a social welfare obligation (as with the public sector) (Mbaku, 1998). In such a situation, incomes and revenues are earned as individuals, groups and agencies indulge in productive ventures (Mbaku, 1998). However, this is not the case with some natural resource-rich countries, especially developing countries. In these countries, incomes are sometimes earned or transferred and revenues are lost in an unproductive manner partly due to the activities of individuals termed 'rent-seekers'(Aidt, 2016). The behaviour of these rent-seekers is known as 'rent-seeking.'

The rent-seeking concept emphasises the role of power groups and institutional frameworks in influencing the allocation and distribution of resources as well as controlling income and revenues while subtly engaging in productive ventures (Akylbekova, 2015). The operations of rent-seekers are an affront to the natural resource sector because detrimental rent-seeking does not produce any positive wealth shocks. The theoretical model of rent-seeking moves a step further than the Dutch disease model in explaining the resource curse. The Rent-seeking concept, according to Tornell and Lane (1999) attributes the low economic performance in a resource-rich country to a situation where appropriated income was consumed, invested in the informal sector, or sent overseas because governmental capital expenditures were not utilised efficiently. This phenomenon is termed the voracity effect.

Additionally, rent-seeking is defined by Fischer (2004) as an activity involving the use of limited resources to produce and capture artificially-created (and generally politically contestable) rents as well as transfers that are not part of society's desired income redistribution. Again, rent-seeking is defined by Latkov (2014) as people or organisations attempting to improve their personal wellbeing while contributing negatively to the net welfare of society.

The rent-seeking concept first seems to suggest that weaker, corrupt and inefficient individuals and state institutions are partly responsible for the woes of a resource-rich country that is struggling to develop. The second aspect of the model is what has been critiqued. That is, in the presence of stronger institutional frameworks and a restricted tendency to be corrupt, the potential for rent-seeking activities is likely to be suppressed. Here, institutions may reduce or by extension prevent rent-seeking. However, the rent-seeking model failed to include the role of institutions in the resource curse discourse. Against this background, the institution model was developed to further explain the nature of the resource curse in a country with much emphasis on institutional quality.

Institutional Theory

The introduction of the institutions model in the analysis of the resource curse painted a clearer picture of the phenomenon. As developed by Mehlum et al. (2006), the institution model focuses on the role of rent-seeking and institutions in resource-abundant countries. The model is peculiar to the explanations of the resource curse theory because it connects institutions with rent-seeking. Frankel (2010) proposed that the quality of institutions and governance is likely the most generally speculated mechanism via which natural resources might be a curse to long-run growth. He goes on to say that it is not

always evident, a priori, that oil endowments would lead to inequality, authoritarianism, or dysfunctional institutions in general. Mehlum et al. (2006) accentuate that natural resource abundance puts institutions to the test, and as a result, the resource curse only arises in nations with weaker institutional frameworks.

Permanent Income Hypothesis (PIH)

Ensuring the long-run impact of petroleum revenues and sustainability of the gains from hydrocarbon production, theories such as the resource curse, the Dutch disease, rent-seeking as well as the institution theories reinforce the explanations provided by the Permanent Income Hypothesis (PIH). The PIH, proposed by Friedman in 1957 is a good theoretical framework, according to Segura (2006) with desirable intergenerational concerns. Segura (2006) opines that individuals and good governments should both be regarded as forward-thinking, attempting to balance consumption over time in keeping with steady revenues. In terms of petroleum revenue, Ploeg et al. (2011) explain that the choice to either save or spend petroleum revenue lies on a spectrum. At the extreme ends, the *spend-all* rule (where oil revenue is spent as it is received) is found at one end while the permanent income rule (where spending is perfectly smoothed across all periods) is at the other end.

Ploeg et al. (2011) find that to stimulate development, Ghana will spend more of its oil revenue in the short-term than is suggested by the permanent income hypothesis. The permanent income theory holds that governments should borrow ahead of a windfall, payback incurred debt and build up sovereign wealth during the windfall, and support the permanent boost in consumption out of the interest on the accrued sovereign wealth once the windfall has ended. According to Aslanli (2015), the 'bird-in-hand' approach

adopted by Norway allows consumption only of the resource revenues which have already been liquidated. This can be likened to the PIH but with the windfall not valued until it is banked (Ploeg & Venables, 2011).

The above theories specifically the Dutch disease, rent-seeking and institutions model have collectively explained the resource curse and the adverse impact on resource-rich countries. It further justifies that not all countries with abundant resources experience the resource curse and that some countries have been able to avoid it. This provides a fertile ground for Ghana to put in adequate measures to ensure that it avoids the potential resource curse – because it is possible.

Conceptual Framework

The study adapted a conceptual framework as used in Luki (2016) which conceptualised the situation where petroleum revenues could influence institutions. He postulated that if the quality of an institution is critical to the sustainable management of petroleum resources, then it does make sense to understand what makes these institutions good and strong.

According to Luki, institutional quality is influenced by three key factors and these go to affect the management of petroleum revenue. These factors are Participation, Social and Human Capital (see Figure 2). He considers the participation as the involvement of civil society and various stakeholders in the decision-making process as an important component of petroleum resource revenue management. He opines that active participation enhances productive institutions such as accountability and transparency strengthening decision making and the people are likely to gain the trust and confidence of the institutions. He further explained Social Capital as the investments which promote participation and cooperation in the formal and informal institutional

structure. Social Capital can be regarded as a prerequisite for establishing good and strong institutions for managing oil revenues. Human Capital is the stock of knowledge, competencies, skills, experiences and training acquired by individuals. Findings from Katz et al. (2004) suggest that a lack of human capital in a country can have a direct impact on its institutional quality and consequently affect how well institutions function. For instance, revenue mismanagement may be attributed to the inability of the institutions to manage their finances due to lack of or inadequate human capital. In simple terms, if the institutions in charge manage the revenue well (prudent spending), then it (oil resource) becomes a blessing, if they do mismanage (through corruption among others), the country will find itself drowning in the devil's excrement (Luki, 2016).

In conclusion, it can be deduced that strong productive institutions could lead to sustainable management (that is the use of petroleum revenue such that it serves the requirements of the current generation without jeopardising future generations' capacity to meet their own needs) whereas weaker productive institutions will inevitably lead to the oil curse as shown in Figure 2.

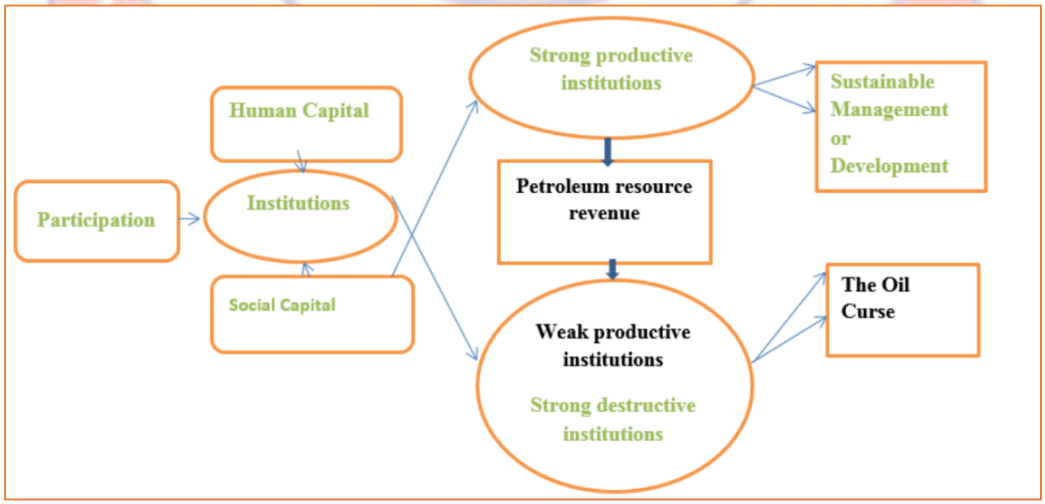


Figure 2: The framework for understanding the relationship between petroleum and institutions
Source: Luki (2016)

Luki's conceptualisation did not include the external and internal shocks that go to influence the institutional quality and petroleum revenue management by extension. This study, therefore, has modified his concept and has made room for external and internal shocks in petroleum revenue management. The study maintained Luki's 3 factors that shape institutional quality and added the sources of petroleum revenue as an internal shock and crude oil price as an external shock to institutional quality. The intuition is that the sources of petroleum revenues and the quantum of revenues generated from these sources can influence the institutional arrangement including the utilisation and management of petroleum revenues. Crude oil prices on the other hand could have a greater influence on institutions. The fluctuations in crude oil prices will mean that all things being equal, revenues could also fluctuate. The robustness of the institutions will be tested during such fluctuations. Petroleum revenues could be managed better in the presence of strong quality institution(s) which will lead to more sustainable resource management in the long run. On the contrary, the weaker institutions will create mismanagement in the petroleum sector and later, lead to the resource curse as demonstrated by Figure 3.

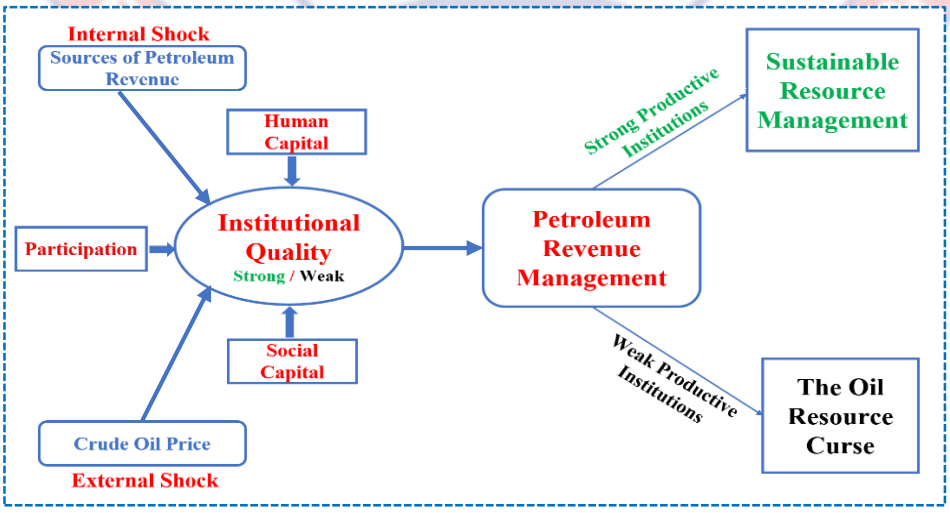


Figure 3: The Role of Institutions in petroleum Revenue Management

Source: Author's construction as adapted from Luki (2016)

The importance of institutions in influencing how nations efficiently manage natural resources for sustainable resource management and economic growth is a key topic that emerges from empirical data on how to overcome the natural resource curse (Ushie, 2013). According to Humphreys et al. (2007), the fundamental cause of these disparate results was recognised as institutional quality, and 'getting the institutions right' became a central goal in efforts to 'escape' the resource curse. To get the institutions right, attention must be given to participation, Social and Human Capital as well as the shocks (both internal and external). This strengthens the institutions and promotes their quality. In effect, the resource curse literature places emphasis on how the quality of governance and institutions could translate natural resource wealth into broad-based Sustainable Resource Development (Bebbington et al. 2018). To this end, in the petroleum industry, where oil thrust may offer an effective check on rent-seeking activities, strengthen domestic governance in oil-producing nations, and prevent, alleviate, or reverse the resource curse, institutional quality has been shown to play a crucial role (Duruigbo, 2005). Among natural resource scholars, Roe et al. (2017) recommends institutional strengthening as a means to escape the oil curse.

Empirical Review

Natural resource-led economic growth winners Botswana and Norway, which have solid institutions and low levels of rent-seeking behaviour like corruption, are classic instances supporting the institutions model and the natural resource curse. While countries with inferior institutions such as Nigeria, Venezuela, Mexico and Congo have worse economic performance compared to Botswana and Norway. Thus, the resource curse is caused by a combination of weak institutions and abundant natural resources as evident in

Torres et al. (2012). Their study confirmed that oil abundance has little bearing on economic growth, but oil concentration helps growth when fiscal prudence and solid effective institutions are present. Subsequently, due to high-quality political institutions, Holden (2013) believes that Norway did not suffer from the Dutch disease or the resource curse.

According to Akylbekova (2015), Oskenbayev et al. (2013) used data from 14 Regions in Kazakhstan and found out that economic growth is not directly influenced by resource abundance. They emphasised that natural resource effects on economic performance are dependent on the quality of institutions.

Further, Khordagui and Saleh (2013) wrote on absorptive capacity in relation to the natural resource curse but their prime focus was on Foreign Direct Investment (FDI). The study was predominantly influenced by the perception that developing natural resource-rich countries lack the human capital, networks and general infrastructure to make use of such technologies – needed to open up an economy when there is a windfall. Educational Quality, Trade Openness and Institutional Quality were identified in their study as the major absorptive capacity factors. These factors, mediate FDI spill-overs and influence an economy's ability to absorb the knowledge and technology spill-overs (Khordagui & Saleh, 2013) from natural resources. Their research concludes that the quality of institutions in a host country would influence the connections and linkages between domestic firms and foreign capital, and hence would increase the likelihood of a spill-over effect.

Ushie (2013) found that institutions in resource-dependent countries suffer from what he terms peculiar malady - a perversion of "rational" and efficient decision-making processes, the destruction of state authority and

credibility, and the formation of a "rentier economy", in which the capture of rents by competing individual and group interests is the major pastime of the entire society. In a recent study, Armstrong (2019) hypothesised that countries with weak institutions are often "cursed," rather than blessed. These earlier findings (Ushie, 2013; Armstrong, 2019) among others, point to the direction that a high-quality institution might, to a significant extent, assist a country endowed with, say, oil resources in overcoming the curse and achieving good economic performance (Frankel, 2010). Simply put, in resource curse analysis, Dutch disease and income volatility are seen as minor issues; what matters is the deterioration of institutions (Shaxson, 2007).

Incidence of resource curse in Ghana

Graham et al. (2020) finds that the likes of Sudan, Angola, Cameroon, Nigeria, Equatorial Guinea and Chad have not been successful in transforming their petroleum resources into the material improvement of their respective countries and peoples. These are living examples of resource abundance which does not translate to economic development. To an extent, such a phenomenon is linked to the infamous resource curse. The resource curse phenomenon, as topical as it may appear in most resource-rich countries, is characterised by opposing views especially in literature. Ghana is not exempted from the resource curse discourse and successive government in response to the risk of the phenomenon, has over the years implemented policies and legislations to optimise the gains in the extractive sector. Notably, in the oil and gas sector, the Petroleum Revenue Management Act 2011, (Act 815) as amended, Petroleum (Local Content And Local Participation) Regulations, 2013, LI 2204 and the Petroleum Exploration and Production Act 2016, (Act 816) are but a few of the legislative instruments implemented to manage the petroleum resources of

Ghana while mitigating the potential impact of the resource curse (Graham et al. 2020).

These regulations notwithstanding and with respect to the challenges facing the political economy in most African resource-rich countries (Graham et al. 2020), in earlier studies by Gyampo (2016); and Gyimah-Boadi and Prempeh (2012), gaps in Ghana's petroleum sector's legislative and institutional frameworks were discovered. Such revelations, together with living examples of many resource-rich, yet underdeveloped countries in Africa, then point to the notion that perhaps, Ghana may not entirely be immune against the resource curse. It is therefore not surprising that according to Kumah-Abiwu et al.(2015), the debate on the resource curse has gathered momentum among scholars and policymakers in Ghana since commercial oil discovery. The debate is usually clustered around the future of petroleum revenues and its management as well as the contribution to the medium to long-term development agenda of Ghana (Kumah-Abiwu et al. 2015).

Many symptoms of resource curse exist in most developing resource-rich countries. In Ghana, Stevens (2015) highlights corruption and relates it to rent-seeking behaviour because when huge amounts of money are available to spend, decision-makers are unavoidably tempted to participate in corruption and rent-seeking. Corruption in the form of rent-seeking according to Mehlum et al. (2006), is a key factor behind the oil curse. Stevens' study agrees that because wealth is concentrated in the public sector or perhaps a small number of corporations, rent-seeking is more common in oil and gas and/or mineral-exporting countries.

Okpanachi and Andrews (2012) likened the existing socio-economic and environmental conditions in many mining (gold, bauxite, diamond, etc)

communities in Ghana to the Nigerian case (e.g., Niger Delta). As a result, they cautioned academics against being overly hopeful about Ghana's chances of escaping the resource curse.

Experiences and lessons from Norway and Botswana provide a source of hope for the oil economy of Ghana while that of Sudan, Angola and other neighbouring African countries further justifies the need for Ghana to reinforce its quest for economic development while avoiding the resource curse (Kumah-Abiwu et al. 2015). Overcoming the resource curse is indeed a formidable challenge —but not an insurmountable one (Cavnar, 2008). Kumah-Abiwu et al. (2015) opine that there is no question that democratic institutions are important and must be recognised as such in Ghana's efforts to break free from the resource curse. Ghana's stable political system, though fragile (Cavnar, 2008), the country's relative economic diversity and robust civil society have positioned it to develop a "structural immunity" against the resource curse (Kopinski et al. 2013). Adams et al. (2018) also adds that the major factors in escaping the natural resource curse include good governance, quality institutions, government efficacy, accountability and corruption control systems as well as natural resource sustainability accounting. Empirical evidence, therefore, suggests that the so-called curse should rather be perceived as a treatable disease (Adams et al. 2018).

Responsiveness of Petroleum Revenues to Variations in Crude Oil Price

Most studies (Kamasa et al. 2020; Awunyo-Vitor et al. 2018; Nchor et al. 2016) on the subject of crude oil price volatilities tend to tilt towards the impact of such oil price variations on the macroeconomy as a whole. Specifically, Kamasa et al. (2020) indicate that variations in crude oil prices have a significant impact on economic wellbeing. At the global level, Awunyo-

Vitor et al. (2018) claim that crude oil price fluctuations and their impact on economic growth continue to be a serious issue for an increasing number of economies. These changes in oil prices, however have a different impact on different regions of the world. As a result, Jobling and Jamasb (2015) claim that developing countries are more responsive to oil price rises.

Other studies have also centred around variations in oil prices and government revenue. Findings by Luciani (2011) suggest that crude oil price volatility is a major concern for all commodity exporters, as it directly or indirectly affects government revenue. The economy of Ghana, like most developing economies, is highly vulnerable to variations in crude oil prices. As a consequence, Nchor et al. (2016) conclude that upward oil price shocks contribute to about 30% of government spending swings, whereas negative oil price shocks account for about 8%. According to Awunyo-Vitor et al (2018), there is a negative relationship between oil prices and economic growth.

Lessons learnt and gaps from related studies

Table 2 provides a summary of empirical studies that relate to the objectives of this research. From an institutional and legal/regulatory perspective, studies from the likes of Brunnschweiler (2008); Aryeetey and Ackah (2018); Abraham (2019); as well as Stephens (2019) make a strong case for the role the political institutions play in the overall governance of natural resources and petroleum revenues in particular. This tends to suggest that quality institutions and prudent management of the abundant resources are key in transforming natural resources for development and escaping the infamous resource curse in the process. Fortunately for Ghana, there is a PRMA that guides the management of petroleum revenues (Gyampo, 2016). To an extent, the PRMA has been instrumental in promoting transparency and accountability

in the collection, distribution and utilisation of petroleum revenues (Shafic & Ennin, 2021). That notwithstanding, studies by Ali-Nakyea et al. (2019); Gyeyir (2019); Ackah et al. (2020); and Sefa-Nyarko et al. (2021) find that the governance of petroleum resources in Ghana is fraught with challenges.

Additionally, studies by Wattanatorn and Kanchanapoom (2012); Awunyo-Vitor et al. (2018); and Stella et al. (2019) focused primarily on the impacts of crude oil price variations on petroleum revenues and also the general economy at large. Oil revenues contribute to government revenue and as a result, unanticipated changes in crude oil prices could potentially create fluctuations in the overall government revenue as well (Stella et al. 2019). Thus, scholarly discussions about price volatility in petroleum revenue governance seem to have been justified.

Also, the review found that earlier studies have adapted various research methodologies in answering their respective research questions. It can be observed from Table 2 that both qualitative and quantitative research approaches have been adopted in researches related to petroleum revenue management. Accordingly, where the petroleum revenue collection and allocation is considered, most of the studies relied on qualitative approaches. As a results, some of the researchers adopted descriptive analysis and stakeholder interviews as part of their methodology. On the other hand, quantitative approaches dominate those involving crude oil price variation where regression analysis was mostly used.

Table 2: Summary of related studies on Petroleum Revenue Management

Author(s)	Title/Research	Methodology	Key Findings
Brunnschweiler, (2008)	Cursing the Blessings? Natural Resource Abundance, Institutions, and Economic Growth	Quantitative research: Regression analysis.	Natural resources in abundance do not always deteriorate institutions; in fact, they may have a positive impact.
Awunyo-Vitor et al. (2018)	Do oil prices influence economic growth in Ghana? An empirical analysis.	Quantitative research: Regression analysis.	The price of oil has a negative correlation with economic growth.
Ackah et al. (2020)	Balancing debt with sustainability? Fiscal policy and the future of petroleum revenue management in Ghana	Desktop review, Content analysis and Descriptive analysis.	Ghana's debt policy rating has worsened despite increased oil income inflows and the utilisation of a portion of those proceeds to settle debt.
Abraham, (2019)	Petroleum Revenue Management in Ghana: The epoch of high expectation in perspective	Qualitative Research: Desktop Review	The management and utilisation of government income generated by natural resource exploitation is critical to a country's ability to escape the resource curse.
Stephens, (2019)	Framework for petroleum revenue management in Ghana: Current problems and challenges	Qualitative Research: Desktop Review	The PRMA has helped in exposing some abuses and holding relevant parties to account, thus mitigating what could have been very gross abuse.
Sefa-Nyarko et al. (2021)	Petroleum Revenue Management in Ghana: How does the right to information Law Promote Transparency, Accountability and Monitoring of the Annual Budget Funding Amount?	Qualitative Research: Desktop Review,	Petroleum governance is still centralised (in Ghana) even if there is de-jure decentralisation of authority.
Aryeetey and Ackah (2018)	The boom, the bust, and the dynamics of oil resource management in Ghana.	Desktop review, Content analysis and Descriptive analysis.	Oil reserves are neither a blessing nor a curse. The way these resources are managed can determine whether they are profitable or not.

Table 2 continued

Ali-Nakyea et al. (2019)	Are Sub-Saharan African Countries Losing it on Oil and Gas Revenue Management Too? Evidence from Ghana	Qualitative research: Desktop review	Though Ghana appears to have a strong governance and institutional structure in place to manage oil and gas earnings effectively and transparently, the PRMA has failed to address the issues of overall budget sustainability and oil revenue volatility, and it lacks the authority to prevent the government from borrowing.
Gyeyir (2019)	The Ghana Stabilisation Fund: Relevance and Impact so far	Qualitative comparative analysis and sensitivity analysis.	The establishment of sinking and contingency funds against the GSF in the PRMA dilutes the GSF's primary purpose and creates a potential for exploitation of the Fund.
Gyampo (2016)	Transparency and Accountability in the Management of Oil Revenues in Ghana	Qualitative desktop review Stakeholder Interview Thematic Analysis	Unlike many other African nations, Ghana is fortunate to have enacted the PRMA, which governs the management of petroleum revenues.
Shafic and Ennin (2021)	Performance Review of Petroleum Revenue Management in Ghana: A SWOT Analysis after a Decade of Production	Qualitative desktop review, SWOT Analysis	The PRMA has played a key role in increasing openness and accountability in the collection, distribution, and use of petroleum revenues.
Wattanatorn and Kanchanapoom (2012)	Oil Prices and Profitability Performance: Sector Analysis	Quantitative research, Regression analysis.	Oil prices have a significant impact on profit of the energy sector.
Stella et al. (2019)	Changes in Crude Oil Prices and the Flow of Government Revenue.	Quantitative research, Regression analysis.	Change in oil prices can significantly and positively affect government's oil revenue
(Acquah-Andoh et al. 2018)	Oil and Gas Production and the Growth of Ghana's Economy: An Initial Assessment	Quantitative Research; Regression analysis	Given the country's petroleum production profile, the Act's constraints and the Finance Minister's discretion have limited the capacity to create considerable buffers to deal with shocks.

Source: Author's Construct, (2021)

Chapter Summary

This chapter reviewed relevant literature concerning petroleum revenue management. The theory of resource curse and the associated concepts such as Dutch disease, rent-seeking, institutions model, permanent income hypothesis were considered to put the study into context. Empirical studies were also reviewed to help identify past researches in the area of petroleum revenue management. The literature review revealed that PRMA, after ten years of implementation faces some challenges which have to be addressed going forward. Variations in crude oil prices as evident in literature, affect petroleum revenues in diverse ways.

However, an empirical gap exists where limited studies have been conducted at the micro-level to analyse the responsiveness of the various sources of petroleum revenues as well as the distribution of petroleum revenue against variations in crude oil prices. This study is thus tailored to bridge the gap as identified in these researches in so far as petroleum revenue management in Ghana is concerned.

The study adapted qualitative and quantitative research methodologies such as Content and Thematic Analysis, Ordinary Least Square Regression and Descriptive Analysis as used by earlier researchers. These research methods are explained in the next chapter.

CHAPTER THREE

RESEARCH METHODS

Introduction

This section focuses on the various methods that were relied on in undertaking this study. It touches on the research philosophies, approaches, data and data collection techniques.

The Research Philosophy

This study is guided by a pragmatic research philosophy as a way of putting this study into perspective. A research philosophy refers to a set of beliefs about how evidence on a topic should be collected, analysed, and applied. The term epistemology (which means "what is recognised to be true"), as opposed to doxology (which means "what is thought to be true"), refers to the many approaches to inquiry. As a result, the process of changing things believed into things known is the goal of scientific projects.

A variety of non-positivist ontological points of view may be found in philosophy's historical background. From such a perspective, researchers are particularly interested in what exists. Such stems from the two most widely used approaches in research known as positivism and interpretivism.

Positivism and Interpretivism

These are the two major forms of research philosophies. Positivism, also known as a scientific paradigm, aims at proving or disproving an existing theory or a hypothesis. This paradigm adopts a systematic approach and statistical methods in generalising its findings. Positivism makes use of the hard method (application of scientific knowledge) in explaining a phenomenon. As a scientific paradigm, positivism aims at proving or disproving an existing theory

or a hypothesis (Ryan, 2018). This paradigm adopts a systematic approach and statistical methods in generating knowledge and generalising its findings.

Interpretivism on the other hand stresses the researcher's ability to construct meaning out of a phenomenon. It is thus sometimes referred to as constructionism. Interpretive researchers opine that knowledge of reality, including the domain of human action, is a social construction by human actors (Walsham, 2006). Here, there are no predetermined dependent and independent variables, because the focus according to Kaplan and Maxwell (2005) is on the complexity of human sense-making as the situation emerges. According to Creswell (2003), interpretivism restrict research to social truth reality. In opposition to positivism, interpretivism employs the soft method which is the use of descriptive data analysis techniques with little or no statistical influence. The interpretive approach's strength and effectiveness come from its capacity to deal with the complexities and meaning of occurrences.

Quantitative and Qualitative Approach

Both positivist and interpretative research methodologies are based on distinct assumptions and premises about the nature of the world, and thus need different tools and processes to obtain the necessary data (Ochieng, 2009). Quantitative and qualitative research methods are introduced by positivism and interpretivism. Qualitative and quantitative research approaches and processes are widely employed in a range of fields. There are still so-called paradigm wars in research methodologies, in which academics are divided into two camps: positivism and interpretivism (Rahman, 2017) as discussed above.

To begin, qualitative research is a naturalistic inquiry approach aimed at gaining a deeper understanding of social phenomena in their naturalistic environment. The employment of qualitative methodologies is determined by

the research's idea and aims, as well as the sorts of data required to meet those objectives (Akinyode, 2018). Rather than asking "how frequently" or "how many", qualitative research aims to answer "what", "why" and "how". The primary purpose is not to count, as is common in quantitative research.

Qualitative research is distinguished by the fact that it aids the researcher's understanding of the meaning ascribed to phenomena by those being researched (Buston et al. 1998). This approach makes use of descriptions, expressions, statements and opinions as the researcher seeks to gain in-depth knowledge and understanding of a phenomenon and such research is primarily exploratory. This is employed to find out what's driving people's decisions, attitudes, and motives.

It provides information on the subject or aids in the development of concepts or hypotheses for quantitative research. Qualitative research is also used to uncover trends in people's thinking and attitudes, as well as to go further into a subject (Wyse, 2011). Because it is inductive research by nature, the researcher's interpretation of data is impacted by a theory or preconceived beliefs. Instead, the researcher allowed the facts to speak for themselves, forming themes without the bias of an existing theory (Elkatawneh, 2016).

On the other hand, the quantitative research approach emphasises the quantification/measurement in the collection and analysis of data and thus means ‘amounting’ something. This approach, according to Rahman (2017) attempts to find solutions to issues such as how many, how much, and to what degree, among others. This type of study quantifies data regarding a certain variable as frequencies or rates, allowing researchers to analyse correlations using statistical approaches and employing researcher-initiated stimuli and systematic measurement (Rahman, 2017).

It uses statistics to crunch numbers and decipher what they signify in terms of answering research questions (Elkatawneh, 2016). Quantitative research is characterised by deductive reasoning. Due to this, quantitative research according to Creswell (2009) is more formal and in the format of a statistics report.

In conclusion, qualitative and quantitative research methodologies and procedures constitute various research strategies, with theoretical, epistemological, and ontological issues that differ. Any technique can be used depending on the researchers' goals, data collection methods, and analytical techniques. Even though qualitative and quantitative research methodologies are on opposite ends of the spectrum, they all strive to discover issues using various approaches and propose acceptable answers.

It is possible that one would be preferred over the other depending on the nature of the study and data collection techniques. However, by integrating quantitative and qualitative study and data, the researcher acquires a greater breadth and depth of insight and validation, while offsetting the disadvantages of each approach separately. Jogulu and Pansiri (2011) find that the use of statistics in conjunction with thematic methods can assist minimise over-reliance on the former while simultaneously capturing soft-core ideas and experiences, as well as the subjective variables needed to understand complex social situations.

Pragmatist Research Design

The pragmatist approach adopted for this study encouraged the use of both qualitative and quantitative methods in carrying out the study. The use of more than one approach, also known as ‘mixed methods’ has been used by some scholars (Amponsah & Opei, 2017). However, it did not give rise to the

development of a new theory. Rather, according to Mayring (2014), it combines many stages of analysis with their logic, primarily using a pragmatic research approach. Pragmatism, therefore, makes room for a mix of approaches that aid in answering a research question.

The study made use of such a research design because the methodology is objective-specific and each of the 3 research questions uses a specific methodology in answering them. The possibility of multiple, instead of a single reality, further promotes the use of more than one approach in finding answers to a single research topic. The following paragraphs highlight the various research questions and the various research methodologies deemed appropriate to answer them.

Objective 1: Petroleum Revenue collection in Ghana

The study considered an approach in qualitative research known as content analyses for this part of the study. One of the many qualitative approaches for analysing data and evaluating its meaning is qualitative content analysis (Elo et al. 2014). It has been defined by Krippendorff (2004) as the systematic reading of a body of texts, images, and symbolic matter, not necessarily from an author's or user's perspective. As a technique, it helps to replicate and validate inferences by interpreting and coding textual material(s) that apply to the context in which it is used (Krippendorff, 2004).

Unlike other social science research approaches, content analyses do not involve the collection of data from people. It seeks to analyse reports, documentaries and other information that has been recorded in texts, media, and/or other physical items. Descriptive statistical techniques with less mathematical calculations we used. Content analysis as applied to this study was used to answer the question ‘In what ways are petroleum revenues collected

in Ghana?' and by extension ascertained the amount of revenues that have come from these sources. By so doing, secondary data published by state institutions especially PIAC, Ministry of Finance, GNPC and Bank of Ghana and others were analysed in addition to other academic information in the literature. Content analysis of these various sources of data helped in answering the research questions.

Objective 2: Petroleum Revenues response to variations in Crude Oil Prices

This section used quantitative approaches to answer the research question. Annual (10 data points) and quarterly (40 data points) petroleum revenue data between 2011 and 2020 were sourced from reports from PIAC, the Ministry of Finance, GNPC as well as the Bank of Ghana. The quarterly secondary data from 2011-2020 provided a total of about 40 data points used for this section of the study. These sources provided information on the sources and allocation of petroleum revenue as well as the dated Brent crude oil price. The data were analysed statistically using STATA version 16 and Microsoft Excel version 19. These statistical softwares were employed in the analysis of the regression, coefficient of variation and other descriptive analyses. The quarterly data was log-transformed before the regression analysis to ensure that the analysis is done in reference to a percentage change rather than a unit change (Benoit, 2011). This is to ensure easy and meaningful interpretation of results (Acquah-Andoh et al. 2018) and also reduce extreme values and minimise the impact of outliers (Wooldridge, 2005).

Among other factors, Petroleum Revenue at time t (PR_t) may be influenced by the Price of Crude Oil at time t (PCO_t) and the Volume of Crude Oil Lifted at time t ($VCOL_t$) PIAC (2020). According to PIAC (2020), prices at

the time of sale have been the most important predictor of revenue from each lifting in all fields. The Ordinary Least Square (OLS) Regression model used for the study is specified as below:

$\ln PR_t = \beta_0 + \beta_1 lnPCO_t + \beta_2 lnVCOL_t + \varepsilon_t$. Where;

PR_t Represents Petroleum Revenue at time t

β_0 Represents a constant

β_1 Represents coefficient of Price of Crude Oil at time t

PCO_t Represents Price of Crude Oil at time t

β_2 Represents coefficient of Volume of Crude Oil Lifted at time t

$VCOL_t$ Represents Volume of Crude Oil Lifted at time t

ε_t Represents the error term.

Table 3: Variables used in the Study

Variables	Type	Description/Measurement
lnPR	Dependent	Log of Total Value of Oil Lifted by the Ghana Group (in Million US$)
lnPCO	Independent	Log of dated Brent Price of Crude Oil (US$)
lnVCOL	Independent	Log of Volume of Crude Oil Lifted by the Ghana Group (in million barrels)

Source: Author, (2021).

1. **Total Value of Oil Lifted by the Ghana Group (Petroleum Revenue (PR))**

PR represents the revenue Ghana received through the lifting of crude oil. It is considered as the total value obtained from the lifting of crude by the Ghana group from the various oil fields. This constitutes petroleum revenue for the Government of Ghana from 2011-2020.

2. **Price of Crude Oil (PCO)**

PCO represents the price of crude oil. It is the price for which crude oil produced is sold on the domestic and/or international market. The study used the dated Brent benchmark price from 2011-2020.

H_0: There is no significant relationship between PCO and PR

H_1: There is a significant relationship between PCO and PR

3. **Volume of Crude Oil Lifted (VCOL)**

VCOL takes into consideration the total volume of crude oil lifted by the Ghana group. This is sold at a price (PCO) for revenues (PR) to accrue to the state. The study sought to examine the extent to which the VCOL influences PR.

Objective 3: Stakeholder perception of Revenue Management in Ghana

This research question is answered using both qualitative and quantitative research approaches. Here, a questionnaire consisting of seven (7) closed-ended questions and specific semi-structured interviews were employed to elicit primary data from stakeholders. Primary sources of data are first-hand recordings of information or the actual data itself. It is explained by being present throughout the experience, event, or moment and, as a result, being near to the data in time. An interview is an example of data collection techniques. According to Burns (1997) 'an interview is a verbal interaction, normally face to face, but the telephone may be used, in which an interviewer seeks to obtain information, views or opinions from another person'. It is any face-to-face or non-face conversation between two or more people with a specific goal in mind.

An interview is a data gathering (generating) technique in which participants are asked questions orally. Answers to the questions asked during the interview were recorded by writing and electronic recordings. The sequence of topics was determined by the flow of discussions between the researcher and the participants. It was always possible to come back to a topic and probe where necessary and this approach ensured a high level of flexibility during the research.

Participants from which the instrument was administered were 14 key stakeholders who were well versed with information and knowledge about petroleum revenue management as well as the PRMA in Ghana. Stakeholder participation in the management of petroleum revenues in Ghana is a key feature of the Act and PIAC has a mandate of ensuring its effectiveness. As a result, key stakeholders in the category of Civil Society Organisations (such as the African Centre for Energy Policy), Government Agencies and Institutions (such as PIAC, Ministry of Finance, Ghana National Petroleum Corporation and Bank of Ghana) and others including key informants from industry and academia were sampled using expert/purposive sampling method and interviewed to ascertain their views on petroleum revenue management in Ghana thus far.

The data collected using the questionnaire was analysed using Statistical Package for the Social Sciences (SPSS) version 26 with responses ranked on a 5-point Likert scale as **Strongly Agree** (1), **Agree** (2), **Neutral** (3), **Disagree** (4) and **Strongly Disagree** (5). This was to help evaluate the general stakeholder perception of the performance of petroleum revenue management in Ghana.

The Interview Procedure and Data Analysis

Stakeholders were sent letters to invite them to participate and contribute to the study. The interview was carried out and recorded after they have agreed to partake with strict adherence to the ethics of research. The audio was then transcribed and analysed using thematic analysis. In general terms, thematic analysis involves identifying patterns or themes within qualitative data. Here, themes are extracted and coded from the responses elicited from the participants. According to Ibrahim (2012), this type of analysis allows a researcher to explain the relationship between variables as well as compare different sets of data from different situations within the same study. Themes

and sub-themes identified from the transcript were supported by direct quotations from participants and analysed to know how they compare with literature and empirical studies.

Ethical Consideration

Firstly, approval from the University of Cape Coast Institutional Review Board (UCCIRB) (see Appendix I) was obtained before data collection. Once permission was granted for the interview to be conducted, participants were informed of their rights to participate and to withdraw at any point in time in the research. Their right as participants to free and informed consent was held in high esteem. Additionally, participants were assured of their anonymity in the study while also emphasising that the information they provide will be treated as confidential as possible. To anonymise the participants, as stated earlier, it is important to reiterate that the researcher used pseudonyms assigned to the participants from the various institutions during the collection, analysis and presentation of data. This is done to ensure that ethical issues are adhered to and participants do not feel coerced to provide information.

Chapter Summary

The study is premised on a pragmatist approach and relied heavily on both qualitative and quantitative research methods. The mixed-method approach encouraged the use of both primary and secondary data to answer the research questions. Statistical techniques such as content analysis, descriptive and graphical analysis, ordinary least square regression and others were used with the help of SPSS, STATA and Microsoft excel for the analysis of data. It must be emphasised that the methodology is objective-specific and thus, each of the three (3) research questions were answered using a tailored research

methodology. Research ethics has been upheld to the best of the researcher's knowledge before during and after collection of data for the study.

CHAPTER FOUR

RESULTS AND DISCUSSION

This chapter analyses both the primary and secondary data collected for the study. It is divided into three broad sections seeking to answer the research objectives. Section A provides information on the sources of petroleum revenue to Ghana and how these revenues have been allocated to state funds within the period under study. Section B examines the extent to which petroleum revenues respond to fluctuations in crude oil prices. Since Ghana's oil price is determined based on a dated Brent price (Malden & Gyeyir, 2020), all crude oil prices used for this study were in reference to the Brent crude oil benchmark price. Finally, Section C evaluates the perception of stakeholders on the performance of the PRMA since it was implemented.

Based on data (secondary data 2011-2020 and primary views elicited from stakeholders) available and gathered, the empirical analysis follows.

SECTION A

Assessment of Petroleum Revenue Collection and Allocation in Ghana.

This section on objective one (1) is divided into two parts. The first part assesses the various streams of revenue inflows and particularly how much revenues have accrued to the state from selected sources of petroleum revenues. Further, the section also assesses the allocations made from the Petroleum Holding Fund into various state accounts for various purposes based on the stipulations of the PRMA.

Sources of Petroleum Revenues in Ghana

General Overview

Petroleum receipts in Ghana come from different income streams. Paramount amongst these are Carried and Participation Interest (CAPI),

Royalties, Corporate Income Tax (CITA), Surface Rentals and others. Since 2011, in accordance with the PRMA, the Petroleum Holding Fund (PHF) has received petroleum revenues from these sources for onward allocations into different state funds. Figure 4 depicts the proportion of the various revenues to total petroleum receipts from 2011-2020. Descriptive analysis of data gathered indicates that the CAPI has contributed to petroleum revenue in Ghana more than any other source of revenue which conforms to Atokple (2018). CAPI accounts for about 58% of total petroleum receipts since 2011 while royalty payments and CITA are, respectively, the 2nd and 3rd highest sources of revenue which represent about 25% and 16% since Ghana started receiving of petroleum revenues.

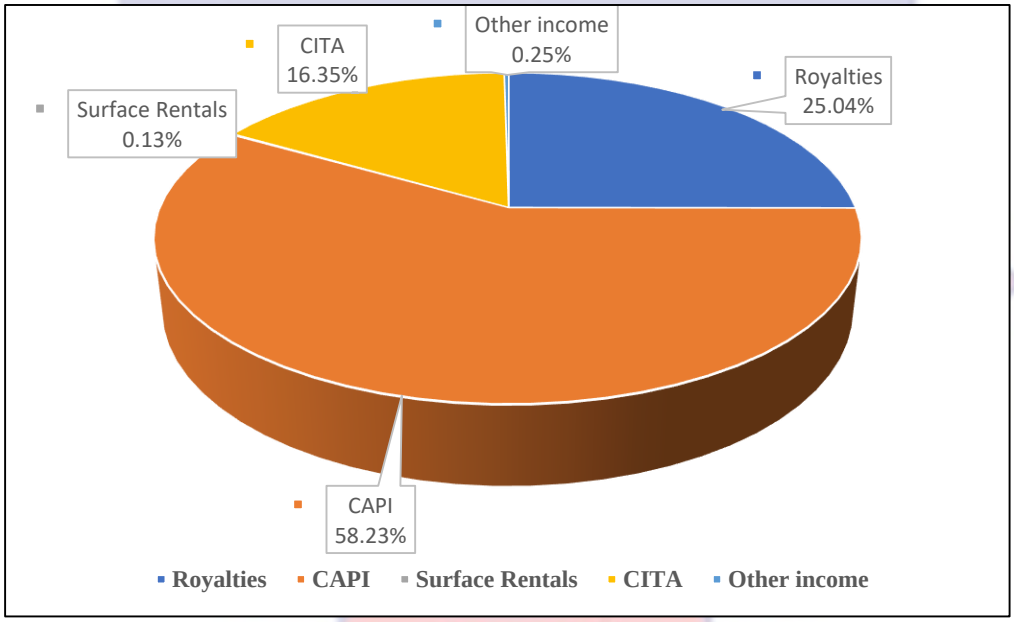


Figure 4: Sources of Petroleum Revenue

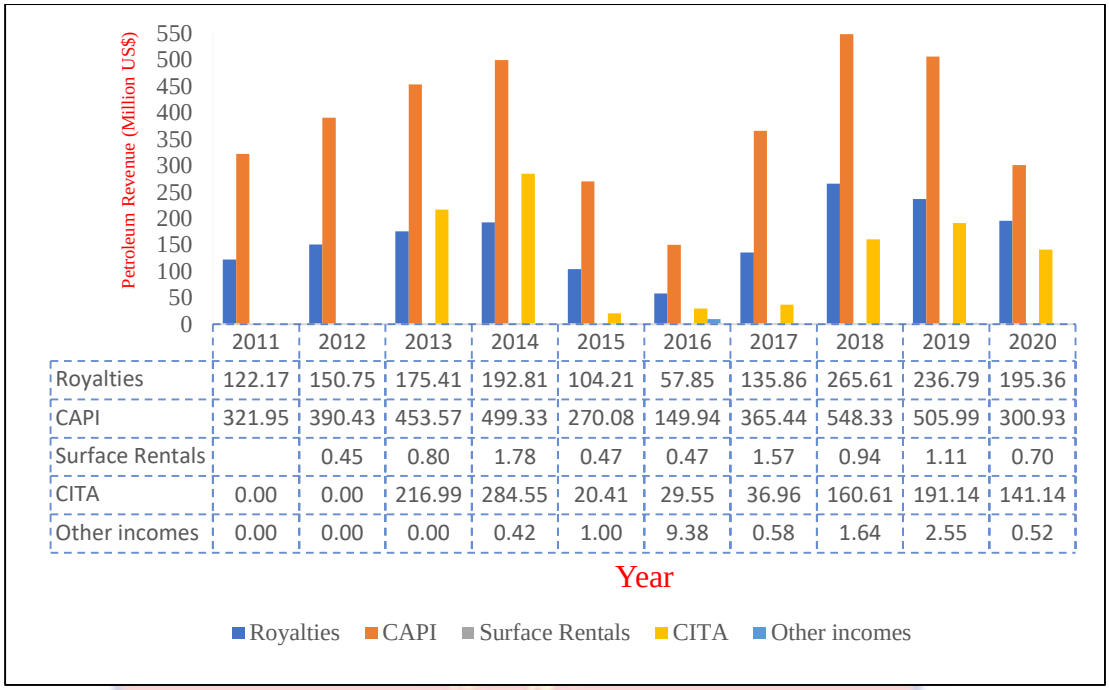
Source: Author's Construct (2021)

Trends in petroleum revenue sources

Over the years, a varying amounts of petroleum revenues has come from different sources in Ghana. These variations are most attributable to fluctuations in production volumes, crude oil price, new oil discoveries as well as decommissioning of defunct oil fields (PIAC, 2016; The Ministry of Finance, 2016b).

It is evident that every year, the CAPI has consistently been higher than any other source of revenue. However, it is not exempted from revenue shocks as it experiences periodic spikes and declines. CITA's contribution to petroleum receipts has consistently been higher than royalty payments until 2015 when royalty payments became the second-highest source of petroleum revenue in Ghana.

Figure 5 shows that all the various streams of petroleum revenues have been subjected to periodic fluctuations. CAPI and Royalties were highest in 2018 but CITA had its peak in 2014. Conversely, CAPI and Royalties recorded their lowest contributions to petroleum revenues in 2016 and CITA contributed its lowest a year earlier. For the first time since 2015, all the 3 major sources of revenue showed a declining trend in 2020. There was a reduction of 40.5%, 17.5% and 26.16% for CAPI, Royalties and CITA, respectively in 2020. The covid-19 pandemic and the associated impact on global oil prices are reported to have led to such revenue shortfalls (Ministry of Finance, 2020). This confirms the findings by Nchor et al. (2016) that indeed the Ghanaian economy is vulnerable to fluctuations in crude oil price.



	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Royalties	122.17	150.75	175.41	192.81	104.21	57.85	135.86	265.61	236.79	195.36
CAPI	321.95	390.43	453.57	499.33	270.08	149.94	365.44	548.33	505.99	300.93
Surface Rentals		0.45	0.80	1.78	0.47	0.47	1.57	0.94	1.11	0.70
CITA	0.00	0.00	216.99	284.55	20.41	29.55	36.96	160.61	191.14	141.14
Other incomes	0.00	0.00	0.00	0.42	1.00	9.38	0.58	1.64	2.55	0.52

Figure 5: Trends in Revenue Sources from 2011-2020

Source: Author's Construct (2021)

On annual basis, as shown in Figure 6, revenue inflows from various sources were highest in 2014. This represents 0.18% slightly higher than revenues in 2018 and 4.4% higher than that of 2019. Since 2011, revenue receipts saw a consistent growth each year until 2015 when revenue decline was recorded. Revenue more than doubled between 2011 and 2014 representing 120.4% growth against the 2011 receipt. There was a 59.53% and 37.61% reduction in petroleum revenues in 2015 and 2016 (least revenue recorded), respectively. The reduction in petroleum revenues in 2016 according to PIAC (2016) and The Ministry of Finance (2016b) is due to volatile crude prices and lower than expected crude oil production from both the Jubilee and TEN Fields. Literature suggests that price volatility will immediately affect government revenue to the extent that government expenditure follows revenue (Luciani, 2011). This affected revenue receipts from various income streams in the year 2016. The continuous decline was reversed in 2017 when revenue grew by

118.63%. This, according to PIAC (2017), was due to an amount of US$579,278.46 earned as interest on undistributed funds held in the PHF during the year. Revenue growth then peaked in 2018 having recorded an 80.18% increment partly due to a 25.83% increase in price. The increase in crude oil price from an annual average of US$53.49 per barrel to US$70.34 per barrel and an increase in lifting volumes from 5,856,921 barrels to 9,783,239 barrels according to the Ministry of Finance (2019) mainly accounted for the revenue growth recorded in 2018. The onset of Covid-19 in the last quarter of 2019 led to a marginal decline of 4.05% in revenues in 2019. The devastating global impact of covid-19 further escalated the woes in the petroleum sector leading to a 31.9% reduction in 2020.

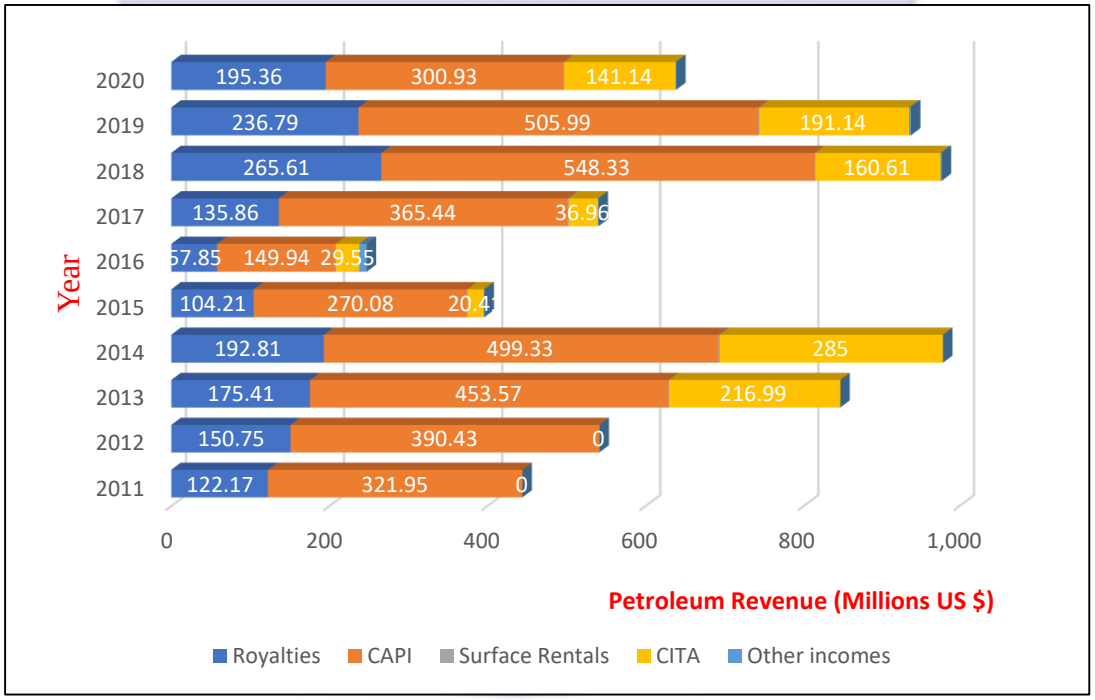


Figure 6: Annual Petroleum Revenues from various sources

Source: Author's Construct (2021)

Revenues from Carried and Participating Interest (CAPI)

CAPI provides the major source of petroleum revenues in Ghana. In section 7 (1) of the PRMA, CAPI is specified as "Revenue due from the direct or indirect participation of the Republic in petroleum operations". Since 2011, there has not been a single year where any other revenue source has been higher than that of CAPI. There was a growth in CAPI from 2011 to 2014. However according to the data, in 2015 and 2016, revenues from CAPI dropped by 45.9% (from US$499million in 2014 to $270million in 2015) and 44.49% (from US$270million in 2015 to US$149million in 2016), respectively. In 2017, revenues from CAPI increased substantially by a margin of 143.7%. CAPI peaked in 2018 at $548.33million and sharply declined by 7.72% and 40.53% in 2019 and 2020, respectively following crude oil price falls. Overall, there has been a fairly positive linear trend in revenues from CAPI within the period under review.

The relevance of CAPI as the most prominent source of petroleum revenue to the state is underscored by PIAC in its 2020 report that CAPI has the potential to boost the country's petroleum earnings, thus, it should be carefully evaluated in future Petroleum Agreements (PIAC, 2020). Figure 7 shows the annual performance of CAPI since 2011.

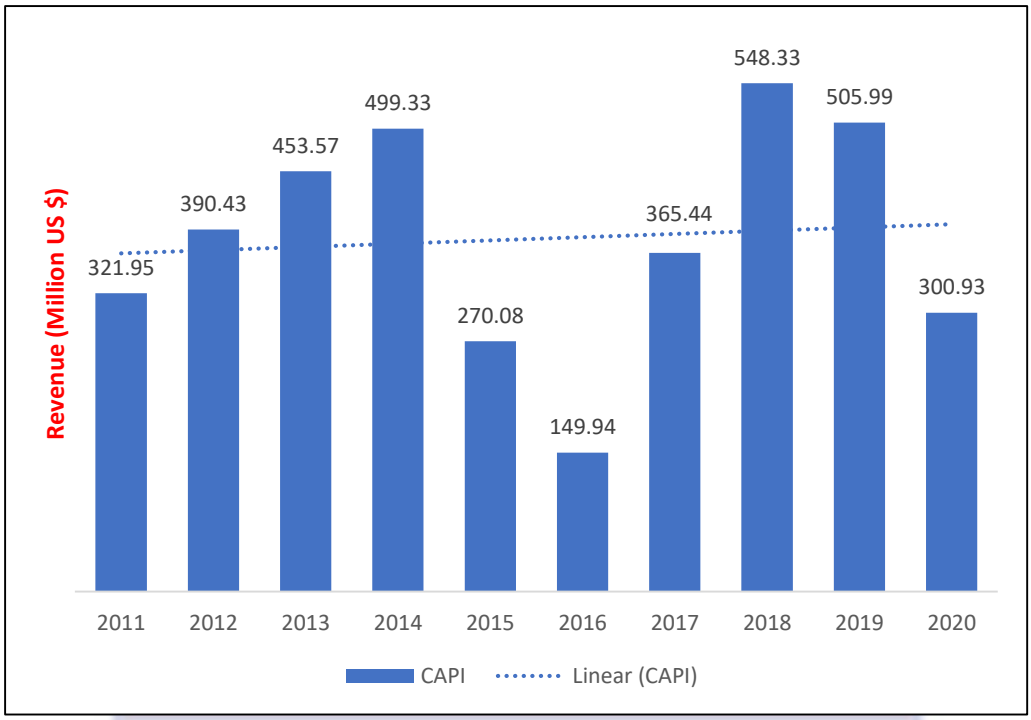


Figure 7: Revenues from Carried and Participating Interest

Source: Author's Construct (2021)

Revenues from Royalty Payments

Royalties, otherwise known as petroleum revenue received as a percentage of gross production or value, is another significant source of revenue for Ghana since 2011. Figure 8 shows revenues from royalties saw a consistent marginal increment from 2011-2014, then dropped by 45.95% in 2015 as well as a subsequent reduction of 44.49% bringing royalty payment to its all-time minimum in 2016 due to oil price declines (Ministry of Finance, 2016a). However, the drop was reversed by a 134.84% growth in 2017. Higher production levels and better crude prices in 2017 account for the rise in revenue (PIAC, 2017). Also, 2018 recorded a significant growth of 95.50% in royalties recording its all-time high in 2018. Unfortunately, the trajectory was reversed following a 10.85% reduction in 2019 and a 17.50% decline in 2020. This is attributable to the impact of crude oil price declines as occasioned by the

coronavirus pandemic (Ministry of Finance, 2021). Just as in the case of CAPI, Royalty also follows a positive trend over the years as shown in Figure 8.

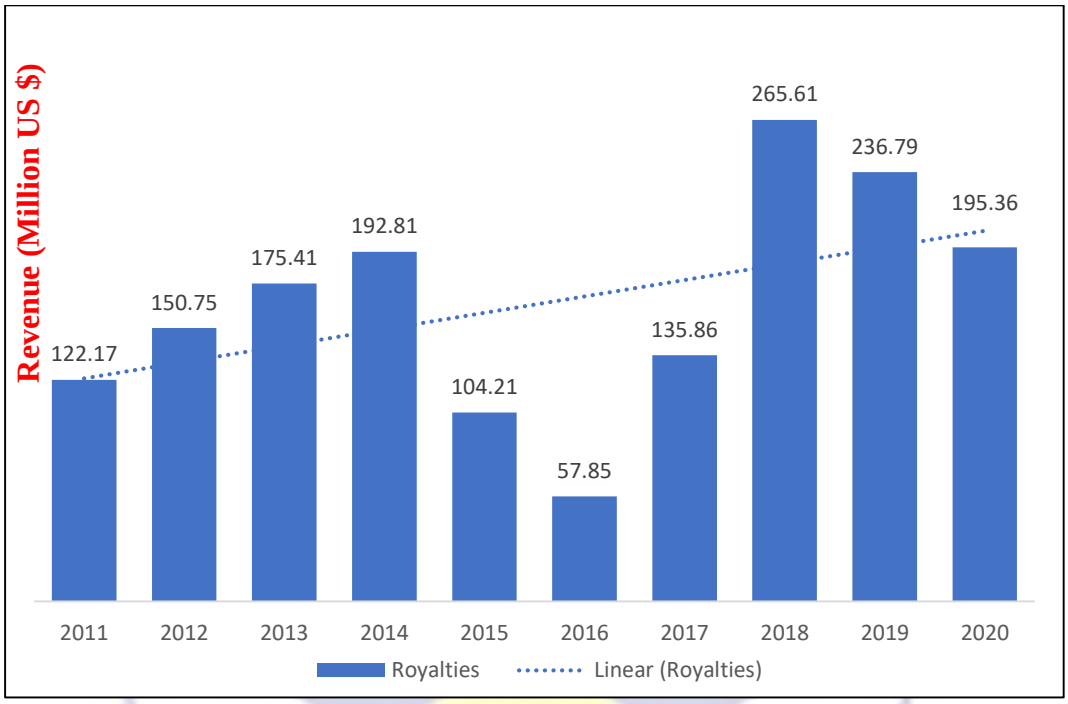


Figure 8: Revenues from Royalty Payments

Source: Author's Construct (2021)

Comparatively, the positive trend in royalty payment is more elastic to the factors causing the variations in revenues than CAPI over time. This means that royalty payment has been relatively more responsive to crude oil price change than CAPI payment. This is reflected in the average annual growth of 17.41% in royalties as against 11.41% in CAPI.

Corporate Income Tax (CITA)

Taxing revenues from International Oil Companies (IOCs) and operations in the upstream oil and gas business constitute another important source of revenue for the state. Despite its 35% rate, CITA, as a profit tax, normally generates lesser revenues than Royalty and CAPI (PIAC, 2020). It is evident from Figure 9 that the first tranche of revenue in the form of CITA was

paid in 2013. That year, a total of $216.99m was paid into the PHF. The CITA payment increased by 31.14% in 2014 amounting to $284.55m making it the highest amount of CITA to be received so far in a year. There was a drastic 92.8% reduction in CITA payment in 2015, thereby reducing the 2014 amount of $284.55m to $20.40m, making it the lowest CITA paid in a year to date. This drastic reduction is due to the global collapse in crude oil prices (Gyeyir, 2019) and as a result, according to PIAC (2015), none of the sources of petroleum revenues achieved the set targets in 2015.

In effect, CITA was the hardest hit, with a negative variation of nearly 92% between predicted revenue and actual revenue in 2015. Also, the lower tax revenues in 2015 were due to the non-payment of tax by Tullow Ghana – the largest stakeholder – in the unitised Jubilee field as well as Anadarko (PIAC, 2015). In addition, the dip in tax revenues for 2016 and 2017 according to PIAC reports (PIAC, 2016; PIAC, 2017) is that the payment of US$27.31m in 2016 by Tullow was only in response to a tax audit by GRA of Tullow's operations from 2011-2014. Lastly, in 2017, taxes paid by Anadarko and Petro SA were wrongfully lodged into the GRA account and such were yet to be transferred to the PHF account as of the time of the 2017 revenue reports.

This situation accounts for petroleum revenue shortfalls in Ghana (Adam, 2014). Panford (2014) blames that on the liberal leases in Ghana which allowed the likes of Tullow, Kosmos and Anadarko to deduct business expenses, including interest payments, without limits on corporate taxes they owe. The thin capitalisation has reduced to zero the corporate taxes paid by these companies (Panford, 2014). This put into perspective a manifestation of the weaker ineffective institutional framework (Ushie, 2013) for tax administration in Ghana during the early years of production.

However, CITA revenues marginally increased by 44.76% in 2016 and 25.08% in 2017. Panford (2014) revealed that the entire Petroleum Tax Division of the GRA had only one statistician as of 2013 but Katz et al. (2004) had postulated that inadequate human capital can have a direct impact on institutional quality and consequently affect how institutions function. This supports the assertion that the GRA had no data on petroleum taxes collected before 2014, even though production began in 2010 (Gyampo, 2016). However, improvements in tax administration in later years strengthened the operations of the GRA which even gave them the power to audit the IOCs. As a result, revenues from CITA increased astronomically by 334.57% in 2018 and slightly by 19.01% in 2019 following improvement in crude oil prices and production also stressing the relevance of institutional quality in petroleum revenue management. Unfortunately, CITA declined by 26.16% in 2020 due to crude oil price shocks and low production volumes. Figure 9 shows the annual CITA performance.

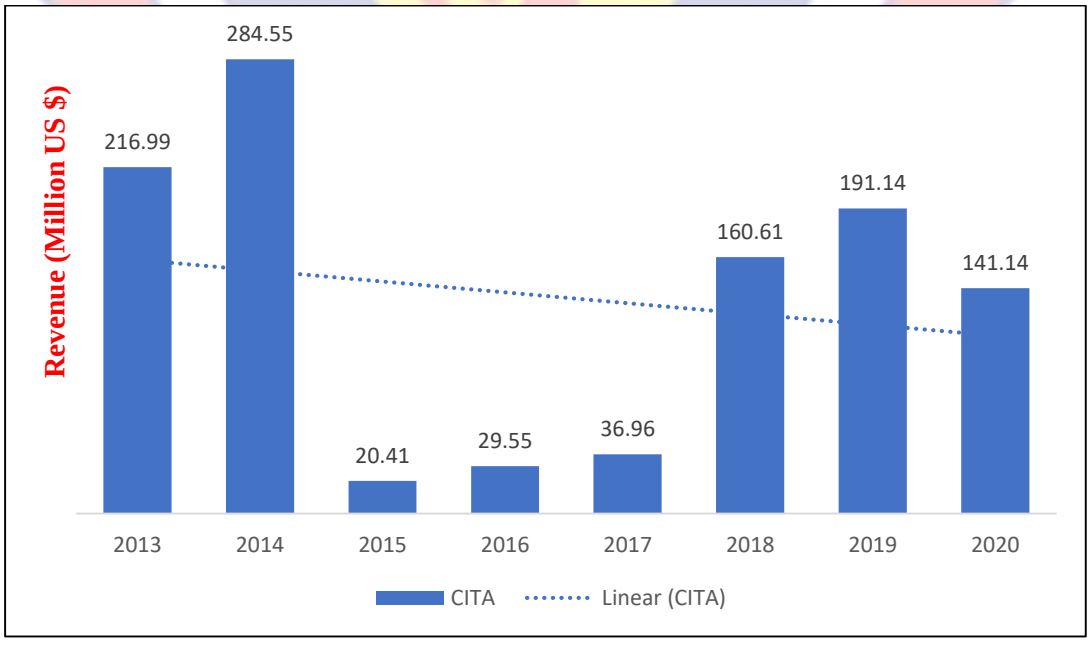


Figure 9: Corporate Income Tax

Source: Author's Construct (2021)

Surface Rentals

This is another source of petroleum revenue regulated by the PRMA. It is considered as the annual rents paid by the IOCs to the State for leasing the surface of the sea and/or land to explore for oil and gas resources.

Surface rentals constitute a marginal source of petroleum revenue for Ghana recently, recording the highest value ($1.78m) in 2014. Its contribution to state revenue dropped significantly by 73.76% in 2015. In 2016, the surface rental was lowest when it dropped by a slim margin of 0.19%. The highest annual growth in surface rentals was recorded in 2017 due to a 237.58% increase in payment. This was due to payment of Surface rental arrears for 14 out of the 17 petroleum agreements before 2017. The 2017 receipts for surface rental comprised arrears of $824,949.74 and $775,762.42 (which was 63%) of the expected surface rental payment for 2017 (PIAC, 2017). It declined by 40.19% in 2018, increased by 18.17% in 2019 and declined again by 37.13% in 2020. The periodic rise and fall in Surface rentals have created a positive trend over the years as depicted by Figure 10. According to PIAC (2020), this source of revenue contributes relatively smaller amounts to total revenue because surface rental payments into the PHF have been missed by several upstream companies leading to arrears of US$2,110,212.23 as of the end of 2020.

Payments for 2011 was not reported because the PRMA was yet to be passed and also the PHF had not been set up by then. As a result, the first Surface rental payment was paid into Ghana's Non-Tax Revenue Account (Adam, 2014). Non-payment of Surface rentals by some IOCs and institutional weakness also account for the revenue shortfalls. For instance, to date, Graham et al. (2020) report that the surface rental charge of US$67,438.36 owed by Oranto/Stone Energy had not been paid since February 21, 2013. This is because

the owners of the company cannot be traced and there is a higher tendency that such an amount could be written off as bad debt. Stephens (2019) considers this as a failure on the part of GRA and also due to improper flow of information between GRA, the Bank of Ghana (BoG) and the Petroleum Commission. This is supported by the literature that perversion of logical and efficient decision-making processes is an example of institutional weakness (Ushie, 2013). Figure 10 shows the annual payment of surface rentals to Ghana since 2012.

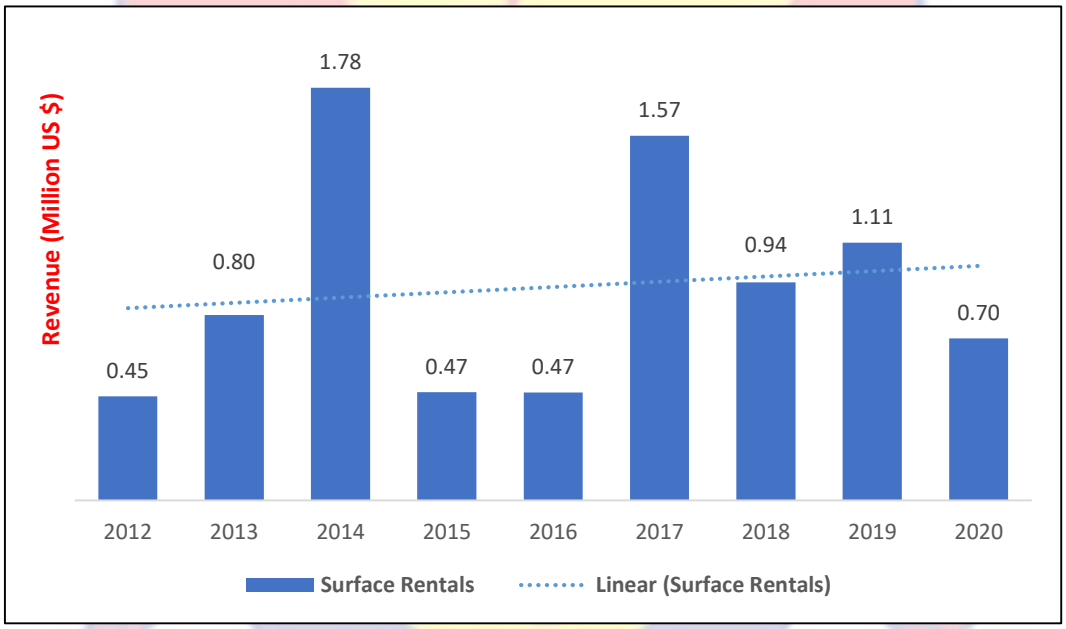


Figure 10: Surface Rentals

Source: Author's Construct (2021)

Periodic Analysis of Petroleum Revenue Sources in Ghana

The study spans 10 years, however, this section seeks to evaluate the periodic changes in revenue from key sources within the first 5years and the recent 5years of PRMA's implementation. Table 4 shows the coefficient of variations for the revenue sources and the period for which it was more variable or stable. From Table 4, it can be inferred that Royalty was more variable (46.63%) in the 2016-2020 period than it was during the 2011-2015 period (24.52%). Similarly, CAPI also varied more in the 2016-2020 period (42.98%)

than the 2011-2015 period (24.15%). Unlike Royalty and CAPI, CITA (130.28%) and Surface Rental (95.49%) varied more during the 2011-2015 period than they were during the 2016-2020 period. Total receipt was relatively stable (40.13%) during the 2011-2015 period than 2016-2020 period (45.05%).

Table 4: Coefficient of Variation for Sources of Petroleum Revenue

Receipt (Million US$)	Period	Mean	Standard Deviation	Coefficient of Variation
Royalty	2011-2015	149.07	36.56	24.52%
	2016-2020	178.29	83.13	46.63%
CAPI	2011-2015	387.07	93.49	24.15%
	2016-2020	374.13	160.80	42.98%
CITA	**2011-2015**	104.39	136.00	130.28%
	2016-2020	111.88	74.00	66.14%
Surface Rental	**2011-2015**	0.70	0.67	95.49%
	2016-2020	0.96	0.42	44.02%
TOTAL	2011-2015	641.51	257.43	40.13%
	2016-2020	668.19	301.03	45.05%

Source: Author's Construct (2021)

Figure 11 shows the variations in revenues obtained between 2011 - 2015 and 2016-2020. From Figure 11, it can be observed that total petroleum receipts have increased marginally by 4.2% within the 2016-2020 period and, thus, the relative instability in petroleum receipts for the period. This is attributed to the contributions made by the Sankofa Gye-Nyame (SGN) and TEN fields in the second period. Royalties, CAPI and CITA have all recorded some variations over the two periods. However, how much they have changed and the direction of change differ. Royalties and CITA have realised a positive

change while CAPI on the other hand has dwindled marginally over the two periods.

In all, growth in royalties (19.6%) has been higher than that of CITA (7.2%). The growth in royalties stems from royalties from the TEN and SGN fields while that of CITA is a result of increments in tax payment and payment of tax arrears most of which were paid after 2015. Notably, there has been a 3.3% fall in CAPI between the period under consideration.

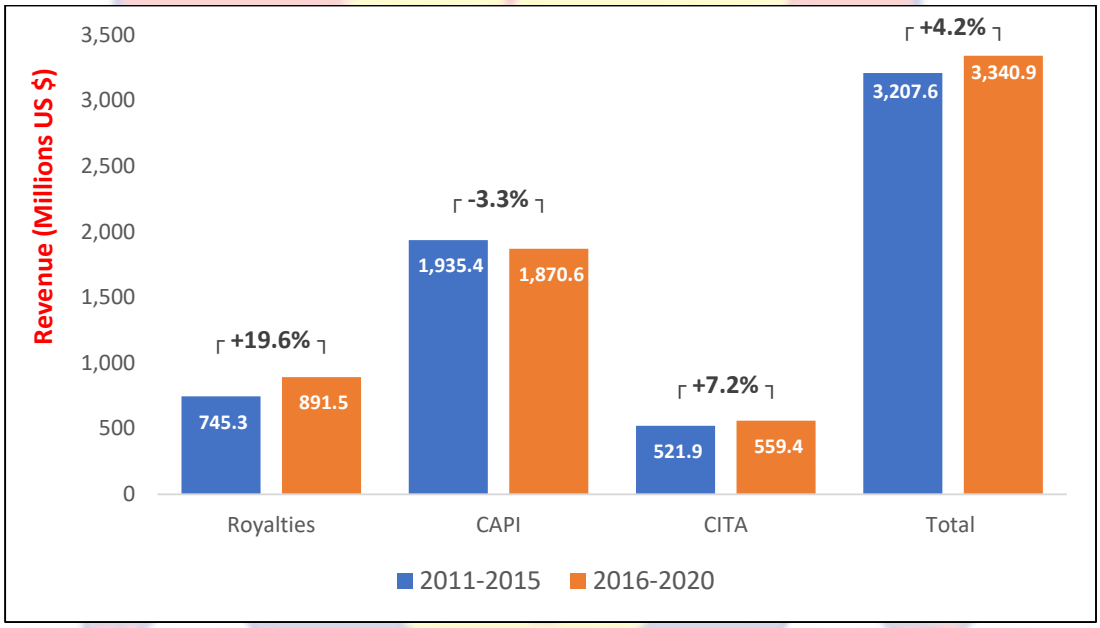


Figure 11: Periodic variations in major sources of petroleum revenue

Source: Author's Construct (2021)

Additionally, regarding Figure 11, comparatively, just by considering revenues from CAPI, Royalties and CITA, it was realised that revenues from CAPI have reduced approximately by 5% within the past 5 years whereas Royalties and CITA increased by 4% and 1% respectively. Between 2011-2015, total receipts from these 3 sources amounted to about US$3.2billion whereas the 2016-2020 period amounted to US$3.3billion. This corresponds to a 3.7% growth in revenues from these sources between 2016-2020. It must be noted that surface rental contribution to total petroleum receipt for the 2011-2015

period was 0.1% while that of 2016-2020 was 0.4%. This was negligible to an extent and the reason for which it was not considered in Figures 11 and 12.

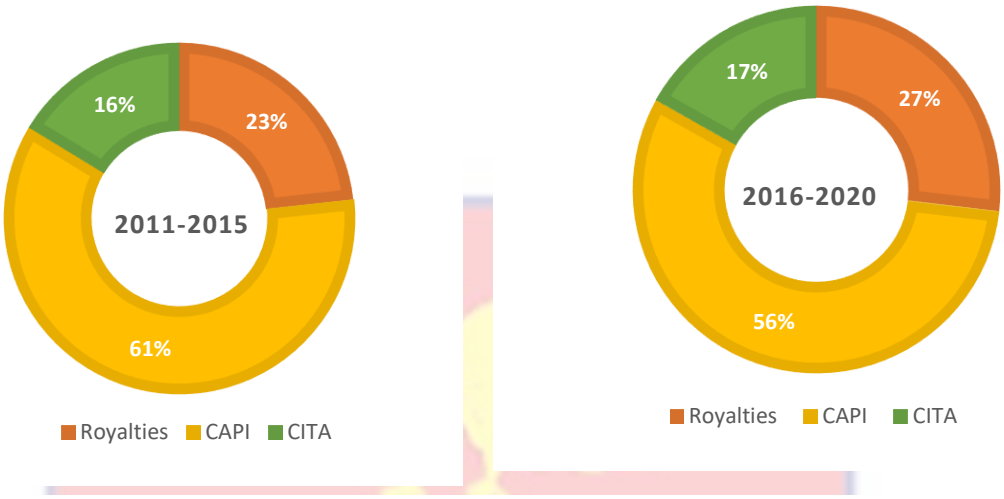


Figure 12: Periodic Variations in CAPI, Royalties and CITA

Source: Author's Construct (2021)

Allocation of Petroleum Revenue in Ghana

Introduction

Having dealt with the various sources from which petroleum revenues are obtained in Ghana, it is prudent to also consider what happens to these revenues when they are paid to the PHF. Just as the PRMA guides the sources from which petroleum revenues are paid, the allocations made from the payment of petroleum revenues to the State are also regulated by the PRMA. It makes provisions for how much should be allocated to every account, when and by whom. The following paragraphs discuss and analyse how much has been allocated to each of the funds, trends in allocations as well as how these funds respond to changes in crude oil prices.

Allocations to the Petroleum Holding Fund (PHF)

The PHF is a central account held at the Bank of Ghana with the mandate to receive all petroleum revenues on behalf of the state from all sources. It is the

primary account from which all allocations are made. Payments made to this account and withdrawals made are guided by the PRMA. Figure 13 shows how the PHF has fared over the period (2011-2020) considered for this study. It could be seen that revenues paid into the fund increased from 2011-2015 and reduced significantly afterwards in 2015 and 2016 when it was the lowest.

The PHF had a massive boost in 2017 and 2018 but was soon reduced in 2019 and subsequently in 2020. It recorded the highest revenue payment in the year 2014 after it increased by 15.6%. Conversely, revenues to the PHF reached its all-time lowest in 2016 after it declined continuously by 59.53% and 37.61% in 2015 and 2016 respectively. The highest growth within a year was recorded in 2017 when receipts from 2016 ($247.18m) more than doubled ($540.41m) in 2017. This translates in percentage terms to a 118.63% increment in revenues paid to the PHF. To an extent, this is a result of an 18.15% improvement in the price of crude oil and a 67% rise in liftings on behalf of the Ghana Group (Manasseh et al. 2019).

On the other hand, the least growth in PHF was recorded in 2015 following a 59.53% reduction which reduced the amount of $978.89m accrued in 2014 to $369.17m in 2015 as shown in Figure 13. The decline was due to a 25.4% year-on-year decline in total liftings and falling crude oil prices and their corresponding effect on the sources of revenues (PIAC, 2015).

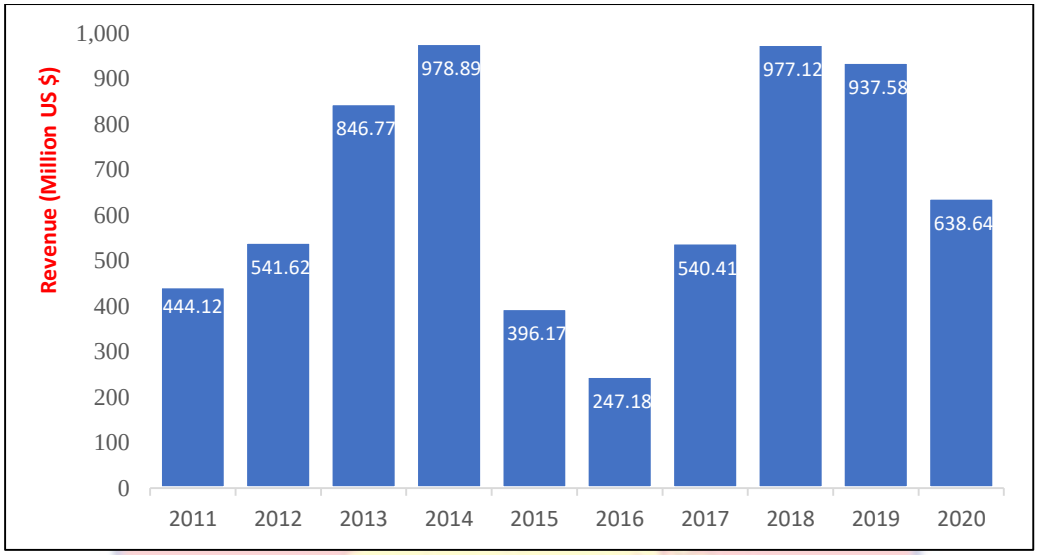


Figure 13: Allocations to the Petroleum Holding Fund

Source: Author's Construct (2021)

Revenue Allocations to Major Petroleum Funds

Section 16 of the PRMA stipulates the destinations of disbursement from the PHF. Section 6(1) specifies in order of priority that disbursements shall be made only; (a) to a NOC, (b) to the Consolidated Fund in support of the National Budget, (c) to the GPF for purposes of savings (expenditure smoothing and assurance of permanent income) and investments and (d) for exceptional purposes according to the provisions of the Act.

As earlier stated, withdrawals made from the PHF to any other state fund are guided by the PRMA. The PRMA specifies the actual percentage of Total and benchmark revenues to be allocated to various state accounts and institutions. These primarily include allocations to the states' National Oil Company, GNPC, The Annual Budget Funding Amount (ABFA) and the Ghana Petroleum Funds (GPF). Further withdrawals are made from the ABFA and allocated to three key areas namely the Ghana Infrastructure Investment Fund (GIIF), PIAC and the Priority Areas. Similarly, as guided by the PRMA,

withdrawals are made from the GPF and allocated to the Ghana Stabilisation Fund (GSF) and the Ghana Heritage Fund (GHF). Figure 14 shows how much has been allocated to the 3 principal allocation areas notably GNPC, ABFA and GPF since 2011.

From the data analysed, out of the total receipt of about $6.55billion, $6.52billion, which represents 99.62% has been distributed since 2011. This difference stems from interest earned from undistributed funds in the PHF (PIAC, 2017) and also interest on late payment of revenues (PIAC, 2020). It can be inferred that about 39% of all allocations made from the PHF since 2011 have gone to the ABFA. The ABFA thus has received a greater portion of all allocations with GNPC getting 31% followed by the GPF which has received 30% of all allocations.

It must be noted that these allocations are made in relation to the specifications of the PRMA. Notably, the ABFA is the main avenue in which oil revenues contribute to the budget (Gyampo, 2016). On average, the ABFA contributes about 4% of the budget (Suleman & Ennin, 2021). While Adam (2017) points to the fact that the PRMA makes provision for ABFA spending to be guided by a long-term development plan, Suleman and Ennin (2021) posits that the absence of this plan means that selection of ABFA priority spending areas has been insufficiently connected to a long-term strategy. As a result, one can only speculate on the potential absorptive capacity issues with regard to Ghana's growing developmental needs because the effectiveness of the ABFA spending also depends on the absorptive capacity and institutional strength (Cameron & Stanley, 2017).

In monetary terms, these correspond to $2.55billion allocations to the ABFA, approximately $2billion to the GNPC (for equity financing and carried and participating interest) to carry out its mandate and about $1.97billion to the GPF. The GSF received 21% ($1.39b) of the 30% allocated to the GPF while the GHF has been allocated the remaining 9% ($585.43m). Although the ABFA has received more of the allocated revenues, in the event of revenue shortfalls, the GSF has been used to cushion budget shortfalls and smoothen expenditure (Gyeyir, 2019). Figure 14 depicts the allocations made.

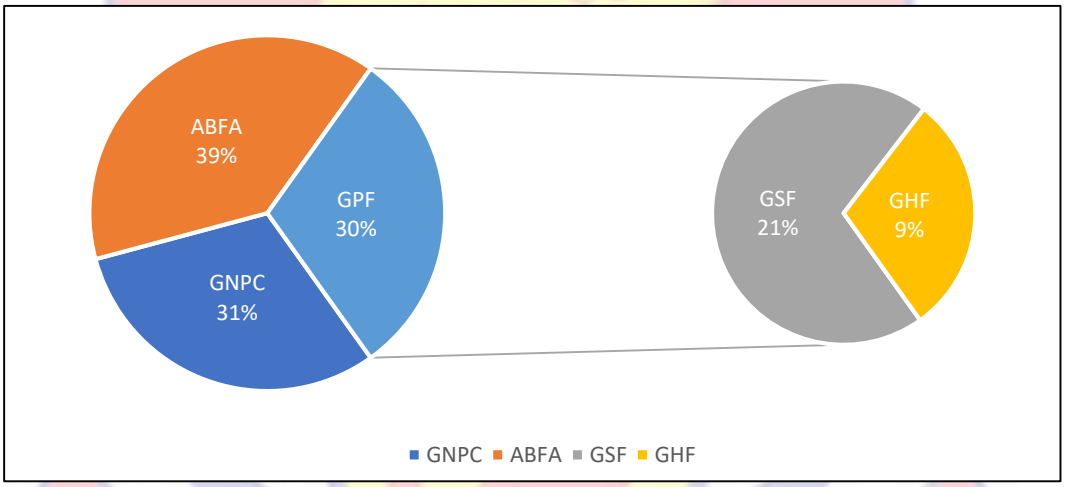


Figure 14: Proportion of Total Petroleum Revenues allocated to various accounts

Source: Author's Construct (2021)

Annual Allocation of Petroleum Revenues

The annual allocation of revenues to the three principal areas (GNPC, ABFA and GPF) has varied over the years. In any fiscal year, any of these principal accounts could receive the most or the least petroleum revenue. None of them has been consistently higher or lower than the other for a maximum of 3 years since the PRMA was implemented.

Notably, there have been years where allocations to GNPC, ABFA and GPF were the lowest and vice versa. Depending on the macroeconomic conditions and government policy direction, more or less could be allocated to

the ABFA to support the national budget. The same applies to GNPC and GPF for various purposes as enshrined in the PRMA. In 2018, there was a spontaneous growth in total allocations when GNPC, ABFA and GPF grew by 67.7%, 38.7% and 114.3% respectively. Total revenue allocated, though has declined over the past two years, allocations to the ABFA has consistently been higher than the others (GNPC and GPF) due to Covid-19 and the corresponding increase in government expenditure (PIAC, 2020). Allocations to GNPC and the GPF have been declining since 2018 as a result as shown in Figure 15.

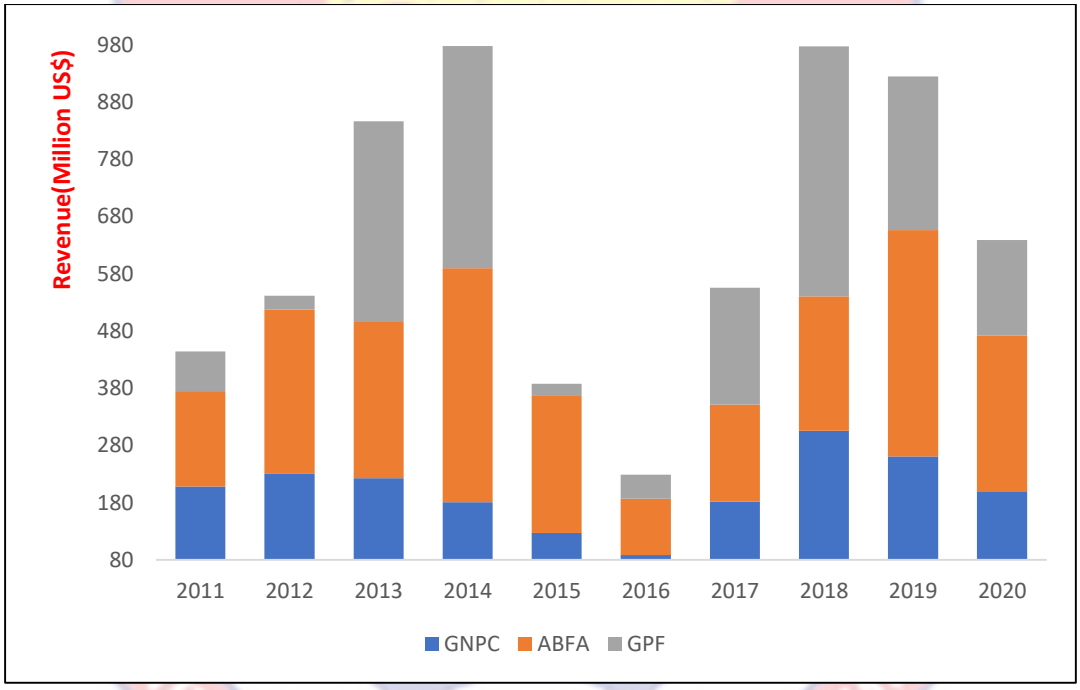


Figure 15: Allocations of Petroleum Revenue to GNPC, ABFA and GPF

Source: Author's Construct (2021)

Allocations to the Ghana National Petroleum Corporation (GNPC)

This section analyses the annual payment of petroleum revenues to the NOC, GNPC as stipulated by the PRMA. Section 16 of the Act specifies that the cash or barrels of oil equivalence of petroleum ceded to the NOC shall not exceed 55% of the net cash flow from the CAPI of the republic after deducting the equity financing cost. The data analysed show that since 2011, GNPC has

received about 31% of its CAPI in total. From Figure 16, it could be seen that allocations to GNPC has been changing over the past 10 years. The decline after 2014 as seen in 2015 and 2016 is attributed to low revenue receipts in the period due to price declines and reduced production.

GNPC received its least revenues ($88.5m) in 2016 and its highest revenue ($305.27m) in 2018. The highest percentage growth was recorded in 2017 following a 105.7% increase while the least growth was achieved in 2016 when it dropped by 30.2%. It has continuously declined in the past 2 years by 14.6% in 2019 and 23.8% in 2020. From Figure 16, it is evident that allocations to GNPC follow a positive linear trend signifying that over time, more revenues are being allocated to the GNPC due to revenue growth and receipt of the required allocation as stipulated by the PRMA.

The success of the Corporation is reflected in among others, the tremendous contribution of its CAPI to the total volume of revenues received (Atokple, 2018). The corporation is also consolidating its operatorship drive for efficiency and financial independence while aggressively exploring inland and frontier basins. That notwithstanding, the GNPC has come under constant criticism over the years for several reasons. Key amongst these include a digression from its core mandate for instance its sponsorship of the Black Stars and persistent involvement in unrelated CSR activities (Stephens, 2019) which have caused financial losses to the state (Abraham, 2019). These, coupled with excessive political interferences hampers the operations of the Corporation. The prevalence of such deficiencies in GNPC stimulates corruption, rent-seeking which gradually weakens the ability of the institution to deliver on its mandate which is synonymous with the findings of Akylbekova (2015).

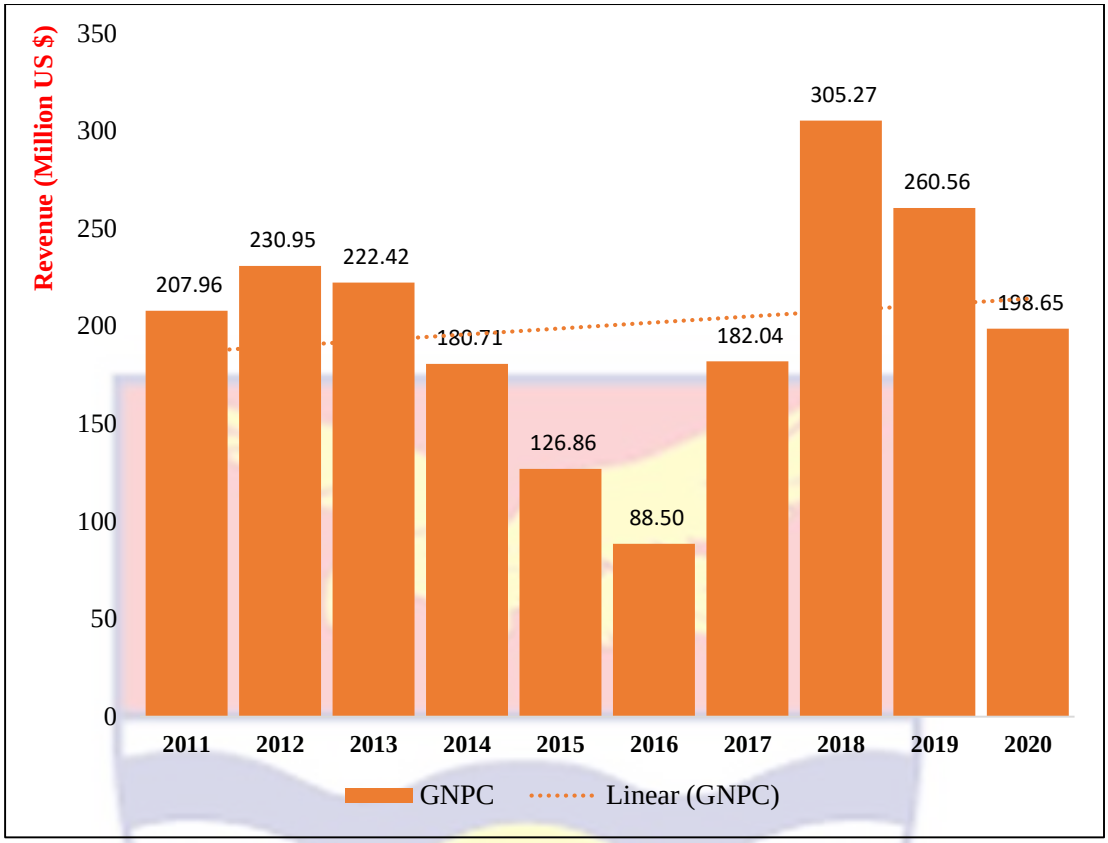


Figure 16: Disbursement to GNPC from the PHF

Source: Author's Construct (2021)

Allocation of Benchmark Revenues

The PRMA mandates that once disbursement is made to GNPC from the PHF, the remaining should be disbursed into the ABFA and the GPF. The PRMA specifies that about 70% of the Benchmark revenue be allocated to the ABFA while the remaining 30% goes into the GPF for further disbursements. Figure 17 shows the allocations made into these two subsidiary accounts every year since 2011. From Figure 17, it is evident that both ABFA and GPF show a positive linear trend over the years signifying those allocations made to both has grown over the 10years. Also, the trends indicate that allocations to the ABFA have been higher in general than that for the GPF. This is expected due to the 70% / 30% allocation of benchmark revenue in favour of the ABFA. It is also

imperative to note from the graph that gradually, the gap between the allocations to the ABFA and the GPF is bridging over time.

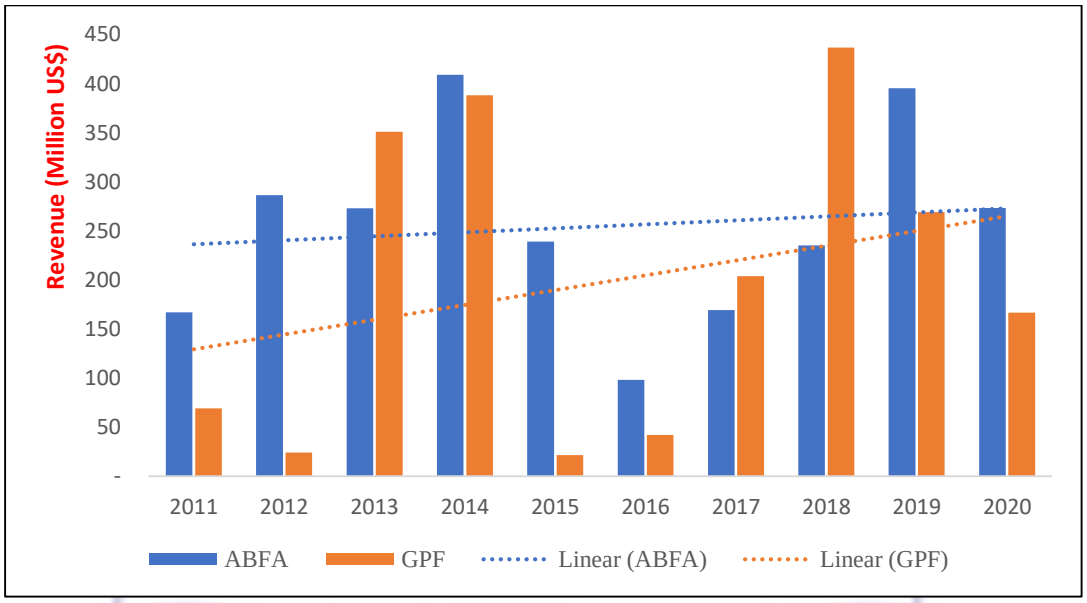


Figure 17: Allocation of Benchmark Revenue into ABFA and GPF

Source: Author's Construct (2021)

Periodic Analysis of Petroleum Revenue allocation in Ghana

Table 5 shows the coefficient of variations for revenues allocated and the period for which it was more variable or stable. From Table 5, it can be inferred that allocation to GNPC was more variable (38.88%) in the 2016-2020 period than it was during the 2011-2015 period (21.67%). Similarly, ABFA allocations were more unstable during the 2016-2020 period (47.79%) than the 2011-2015 period (32.04%). Unlike the allocations to GNPC and ABFA, allocations to the GPF was highly unstable (130.28%) during 2011-2015 period than it was during the 2016-2020 period (64.81%). Allocation to the GSF and GHF also followed the GPF as GSF varied more in 2011-2015 period (105.23%) against 64.81% in 2016-2020. The GHF also was unstable in 2011-2015 (111.69%) as compared to 64.81% in 2016-2020 period.

Table 5: Coefficient of Variation for allocation of Petroleum Revenue

Allocation (Million US$)	Period	Mean	Standard Deviation	Coefficient of Variation
GNPC	2011-2015	193.78	41.99	21.67%
	2016-2020	207.00	82.56	39.88%
ABFA	2011-2015	275.02	88.12	32.04%
	2016-2020	234.36	112.01	47.79%
GPF	**2011-2015**	170.86	182.92	107.06%
	2016-2020	223.67	144.96	64.81%
GSF	**2011-2015**	120.87	127.19	105.23%
	2016-2020	156.57	101.47	64.81%
GHF	**2011-2015**	49.98	55.83	111.69%
	2016-2020	67.10	43.49	64.81%

Source: Author's Construct (2021)

Figure 18 shows that allocations to the ABFA have declined by 14.8% over the past 5years while that of GNPC and GPF increased by 6.8% and 30.9% within the same period. This means there have been more allocations from the PHF to GNPC and the GPF between 2016-2020 than it was in the period between 2011-2015. However, allocations to the ABFA have been less than it was between the 2011-2015 period.

In a related analysis, disbursement from the GPF has seen some variations within the same 5year period. Following the 30.9% growth in the GPF between 2016-2020, allocations from it to the GSF and GHF, respectively, increased by 29.5% and 34.2%. In percentage terms, the growth in GHF has been 4.7% higher than the stabilisation fund within the past 5 years. However, monetary allocation to the stabilisation fund is more than the GHF within the same period.

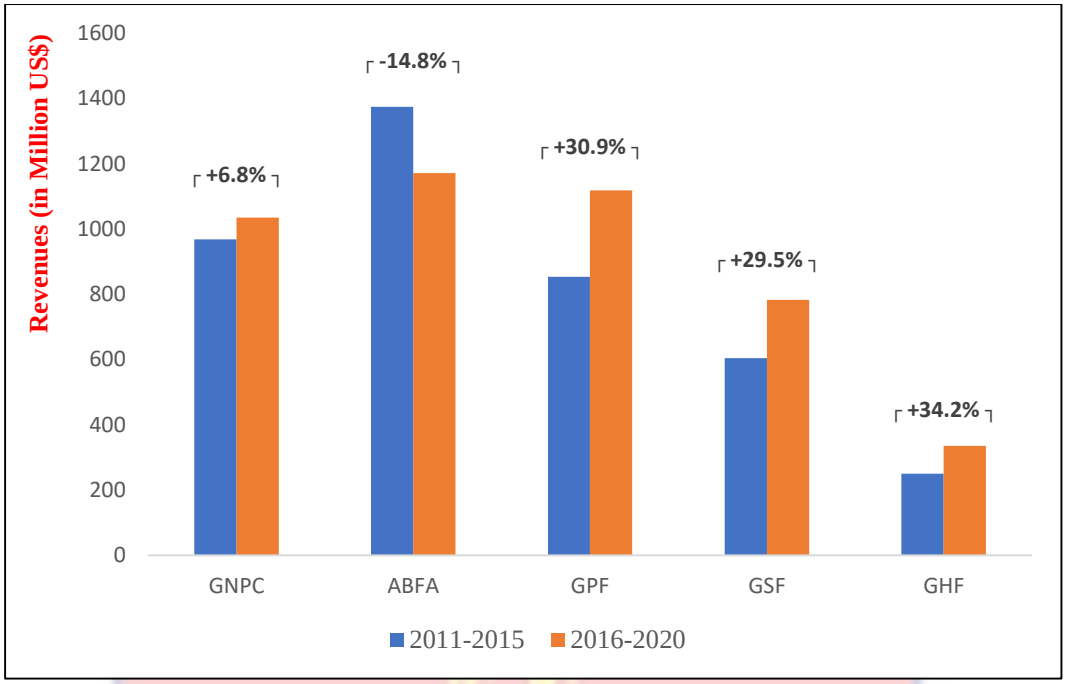


Figure 18: Periodic variations in major allocations of Petroleum Revenues

Source: Author's Construct (2021)

SECTION B:

Responsiveness of Petroleum Revenues to Variations in Crude Oil Price

Introduction

Over the years, crude oil prices have been changing and the 2011 – 2020 period has not been exempted from crude oil price fluctuations. Available literature (PIAC, 2020; Jobling & Jamasb, 2015; Luciani (2011) confirm that petroleum revenues within a period is among other factors influenced by the prevailing crude oil price. Such a relationship has been established, however, the extent to which it affects petroleum revenues and especially in the case of Ghana within the past 10 years is the objective of the study. The regression analysis is first employed to establish the relationship between especially price of crude oil and petroleum revenue and then use it to examine how price variations influence the source and allocation of petroleum revenues in Ghana.

Summary Statistics

This section provides a detailed description of the model variables. It highlights the number of observations, the averages (mean) and standard deviations as well as the minimum and maximum values of the data set. Table 6 shows the descriptive statistics of model variables.

Table 6: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
VCOL	40	1.92	.92	.94	3.98
PCO	40	75.20	29.62	12.24	116.28
PR	40	132.91	59.44	12.23	262.52

Source: Author (2021)

VCOL, PCO and PR represent Volume of Crude Oil Lifted, Price of Crude Oil and Petroleum Revenue, respectively. It must first be emphasised that all the three variables used in this section have 40 observations (see Appendix B). From Table 6, the mean Volume of Crude Oil Lifted in a quarter is 1.92million barrels and its standard deviation is 0.92. The minimum and maximum values of volume of crude oil lifted in a quarter is 0.94million barrels and 3.98million barrels, respectively.

Also, the descriptive statistics of the price of crude oil is worth reporting. From Table 6, the mean price of crude in a quarter is US$75.20 with a standard deviation of 29.62. The minimum price of crude oil recorded in a quarter is US$12.24 while the maximum is US$116.28. Lastly, Petroleum revenue averaged US$132.92million in a quarter with a standard deviation of 59.45 with a corresponding minimum and maximum values of US$12.23million and US$262.53million respectively. In terms of correlation, Table 7 shows that PCO and VCOL are all positively correlated with PR. However, there exists a

negative correlation between PCO and VCOL. The finding thus coincides with the theory that lower crude oil inventories, in light of growing demand, will increase crude oil prices (Ye et al. 2006). This to a large extent explains the negative relationship between oil prices and the volume of oil produced.

Table 7: Correlation Matrix

	lnPR	lnPCO	lnVCOL
lnPR	1.000		
lnPCO	0.562	1.000	
lnVCOL	0.610	-0.205	1.000

Source: Author's Construct (2021)

The results as provided by the STATA statistical software are explained below. The adjusted R – square of 0.857 (85.7%) signifies that about 85.7% of the variations in PR is explained by the variations in PCO and VCOL in the model. It also follows that about 14.3% of the variations in PR is explained by other factors outside of this model.

Table 8: Regression coefficient output

lnPR	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
lnPCO	0.91	0.079	11.59	0.000	0.754	1.073
lnVCOL	0.92	0.076	12.23	0.000	0.771	1.077
_cons	1.44	1.199	1.21	0.236	-0.984	3.874

Where lnPCO, lnVCOL and lnPR (Dependent Variable) represent logged, Price of Crude Oil, Volume of Crude Oil Lifted and Petroleum Revenue respectively.

Table 8 presents the regression coefficients of the variables used in this model. Based on Table 8, the estimated multiple regression equation is written as;

$$lnPR_t = \beta_0 + \beta_1 lnPCO_t + \beta_2 lnVCOL_t + \varepsilon_t$$

$$lnPR_t = 1.44 + 0.91 lnPCO_t + 0.92 lnVCOL_t$$

From the regression equation, all the two independent variables (PCO and VCOL), have a positive relationship with the dependent variable (PR). Holding all other factors constant, the coefficient of PCO means that a 1% increase in the price of crude oil will increase petroleum revenue by 0.91%. Similarly, all things being equal, a 1% increase in the Volume of Crude Oil Lifted (VCOL) within a quarter will increase petroleum revenue by 0.92%. Table 8 also gives the p-values for the independent variables. At a 1% significance level, the Price of Crude Oil (PCO) and the Volume of Crude Oil Lifted (VCOL) are statistically significant. In essence, with a corresponding p-value of less than 0.001, PR (p-value is 0.000) and VCOL (p-value is 0.000) have a significant relationship with Petroleum Revenues (PR). The test significance is supported by earlier studies such as Kitous et al. (2016) and Stella et al. (2019) which found that crude oil prices significantly and positively affect the government's oil revenue.

For robustness check, three post estimations were conducted (See Appendix E & F). These are the Cameron and Trivedi test for heteroskedasticity, Ramsey test for omitted variables, and variance inflation factors (VIF). All three postestimation results showed that the regression estimates are robust. Specifically, the p-values for the test for heteroskedasticity and omitted variables were both greater than the 5% significance level implying there that the distribution of the error term is homogeneous and that the estimates are free from omitted variable bias. Also, a VIF of 1.04 suggests the absence of multicollinearity between the independent variables.

Influence of price on petroleum revenue generation in Ghana

Figure 19 shows that since 2011, a consistent inverse relationship between price and revenues derived from the oil and gas sector was maintained

until 2014. While price reduced by 1.3%, 2.94% and 3.22% in 2012, 2013 and 2014 respectively, revenue, on the other hand, increased by 21.95%, 56.34% and 15.60% in 2012, 2013 and 2014 respectively. This shows that all things being equal, crude oil price falls was having a rather positive impact on petroleum revenues during that period as against the expected negative relationship (Stella et al. 2019). Due to increment in liftings, revenues thus increased even though prices were falling. The revenue increment within those periods was accompanied by a relatively consistent drop in crude oil prices.

On the other hand, since 2014, the direct relationship between price and revenue generation has remained consistent over the period. That is, revenue increased during periods of crude oil price hikes and conversely decreased when prices are falling. Ghana's all-time least revenue was recorded in 2016 and that was to an extent, a response to an 11.98% drop in crude oil prices which led to a 37.61% reduction in revenues for that year. In 2020, the wave of Covid-19 across the globe and its corresponding impact on global crude oil prices did not spare Ghana's receipt of petroleum revenues. Following a 47.24% reduction in crude oil prices, Ghana's total receipts of petroleum revenues accordingly fell by 31.88%.

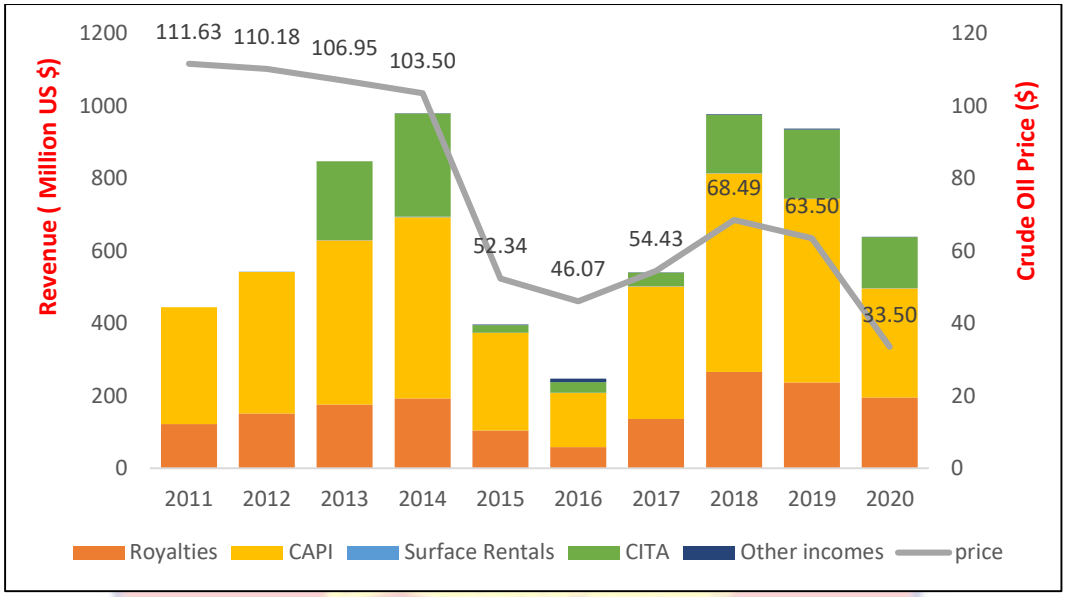


Figure 19: Influence of crude oil price on the sources of revenue

Source: Author's Construct (2021)

Influence of price variation on allocations of revenue

Figure 20 shows how petroleum revenues have been allocated against changes in crude oil price. From Figure 20, apart from 2011, allocations to the GNPC have not been higher than both the ABFA and GPF in any particular year. Since 2012, the price of crude oil and allocations to GNPC has exhibited a positive relationship. Between 2014 and 2016, price falls corresponded to higher allocations to GNPC than ABFA and GPF. In 2017 and 2018, where a continuous price rise was recorded, the majority of the allocations were in favour of the ABFA.

Again, more revenues are allocated to the ABFA than GNPC and GPF when there was a continuous drop in the price of crude in 2019 and 2020. In essence, out of 10 years (2011 – 2020), oil price falls in six years (2012, 2014, 2015, 2016, 2019 and 2020) as shown in Figure 20, coincided with more allocations to the ABFA than the GNPC and GPF. Additionally, except for 2013 where a fall in crude oil price was associated with higher allocations to the GPF,

a rise in price in 2017 and 2018 favoured the GPF over the allocations to the GNPC than the ABFA.

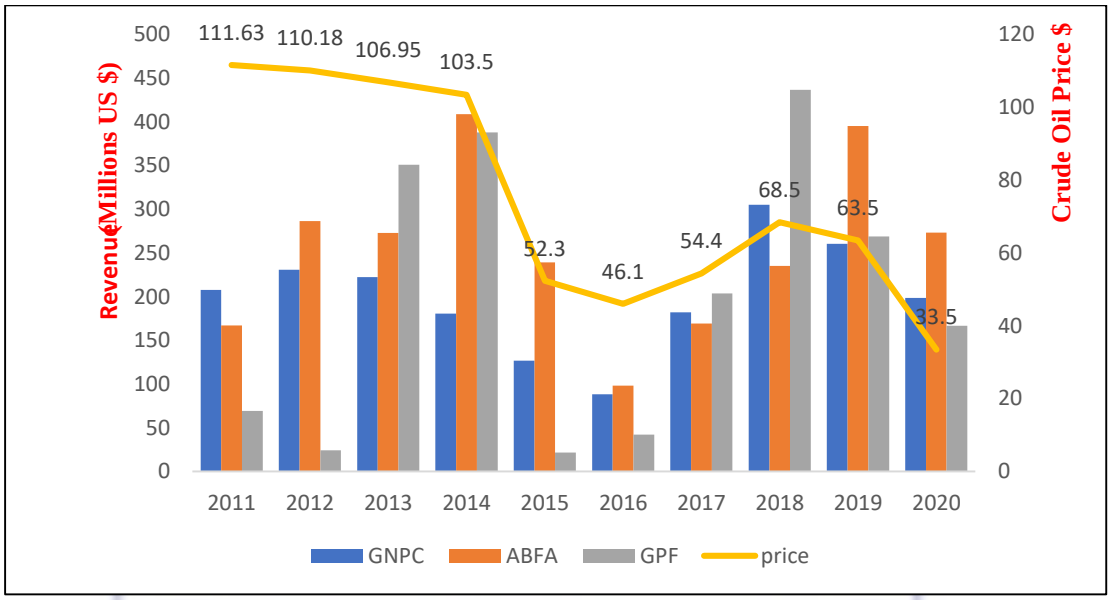


Figure 20: Effect of crude oil price on allocations of revenue

Source: Author's Construct (2021)

Figure 20 shows that since 2014, whenever the price is falling, more revenues are allocated to the ABFA to support the budget. This is in line with Kitous et al. (2016) who acknowledged that even though lower oil prices may affect fiscal balance, however, savings could increase. However, during periods of a windfall, more revenue is allocated to the GPF for subsequent distribution to the Stabilisation Fund and the Heritage Fund. This is to smoothen consumption in periods of economic shocks, thus, affirming the Permanent Income Hypotheses. This reflects the two fiscal rules identified by Lassourd and Bauer (2014). According to them, the Ghana-type/benchmark revenue rule involves spending 70% of revenues and saving the rest while the Permanent Income Hypothesis (PIH) rule ensures that oil revenue spending is limited to a percentage of petroleum wealth.

Relationship between price on allocations to the GNPC

Since 2011, a total of approximately US$2billion, representing 31.72% of all allocations has been allocated to the GNPC. From Figure 21, it can be observed that there exists a positive relationship (with a lower correlation of 0.32) between the price of crude oil and the allocations made to GNPC. This has remained so throughout the years except in 2012 when a 1.3% reduction in crude oil price led to a 11.1% increment in the allocations made to the GNPC. Since 2013, a change in the price of crude leads to a change in the allocations to GNPC in the same direction. However, the magnitude of change has been inconsistent over the period partly due to instability in crude oil prices and production volumes as well as the dictate of the PRMA (Gyeyir, 2019).

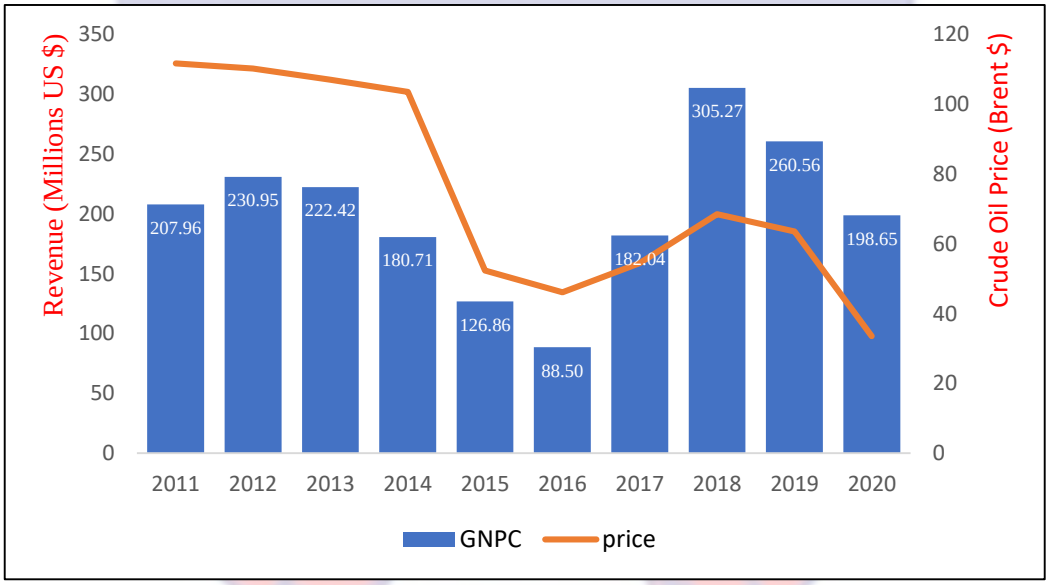


Figure 21: Effect of price variations on allocations made to GNPC
Source: Author's Construct (2021)

Relationship of Price variations and the allocations to the ABFA

The relationship between the ABFA and the price of crude oil has not been easy to decipher. However, there is a very low positive correlation (0.28) between them. As shown in Figure 22, there are periods where the relationship between the two becomes positive and there are times when they are negative.

For instance, in 2012, 2014 and 2019, allocations to the ABFA increased by 71.6%, 49.7% and 68.2% respectively as against a 1.3%, 3.22% and 7.29% reduction in crude oil prices. This highlights the negative relationship between the ABFA and the price of crude oil. On the other hand, the same ABFA has responded in a positive direction to price variations. That was the case in all the years except 2012, 2014 and 2019. In these periods, ABFA rises following a rise in crude oil price and reduces accordingly when the price declines as shown in Figure 22.

Figure 22: Effect of crude oil price on allocations to the ABFA

Source: Author's Construct (2021)

Relationship between Price variations and the Ghana Petroleum Fund (GPF)

To an extent, allocations to the GPF has also been responsive to price changes. Also, Gyeyir (2019) adds that the variance between the benchmark and budgeted revenue influences the GPF. However, the direction of change has been inconsistent over the years though the correlation between them is low (0.12). In some instances, more or less is allocated to the GPF regardless of the

direction of price change. As shown in Figure 23, there was a consistent increment in the allocations to the Ghana Petroleum Funds from 2012 to 2014 even though the price of oil was declining. In 2015, there was a 49.43% drop in crude oil price and at the same time, a 94.4% reduction in the amount allocated to the GPF. It must be emphasised that even as price of crude further declined by 11.98% in 2016, the allocations made to the GPF increased by 94.5%. The years after 2016 have seen a consistent positive relationship between the price of crude oil and allocations to the GPF.

This tends to suggest that allocations to the GPF can either increase or decrease irrespective of the direction in which crude oil price changes. This also confirms that other factors such as the interplay of oil prices and production volumes, budgeted revenues, transfers to the GNPC and discretion/ misinterpretation could influence revenue allocations (Gyeyir, 2019).

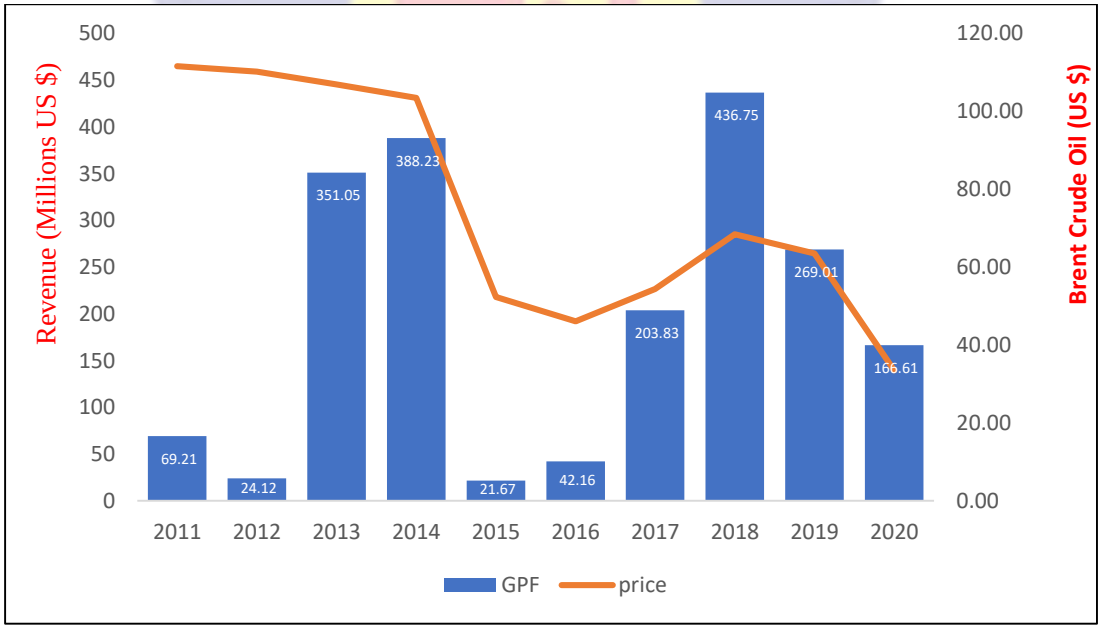


Figure 23: Effect of price variations on the GPF

Source: Author's Construct (2021)

Relationship between price variations and allocations to the GSF and GHF

The GSF and the GHF are the two subsidiary funds that receive petroleum revenues from the Ghana Petroleum Funds. Just Like how the GPF responded to changes in prices, allocations to the GSF and GHF also follow a similar trend. Specifically, the correlation between price and GSF is relatively higher (0.18) than that of price and the GHF (0.14). Figure 24 shows that there was a negative relationship between the price of crude oil and revenues allocated to the GSF and the GHF from 2011 until 2014. A decline in price by 49.43% in 2015 was accompanied by a reduction of allocations to both the GSF and GHF. Conversely, allocations to the GSF and GHF increased when the price reduced by 11.98% in 2016. After 2016, price changes have had a positive influence on the allocations made to the GSF and GHF.

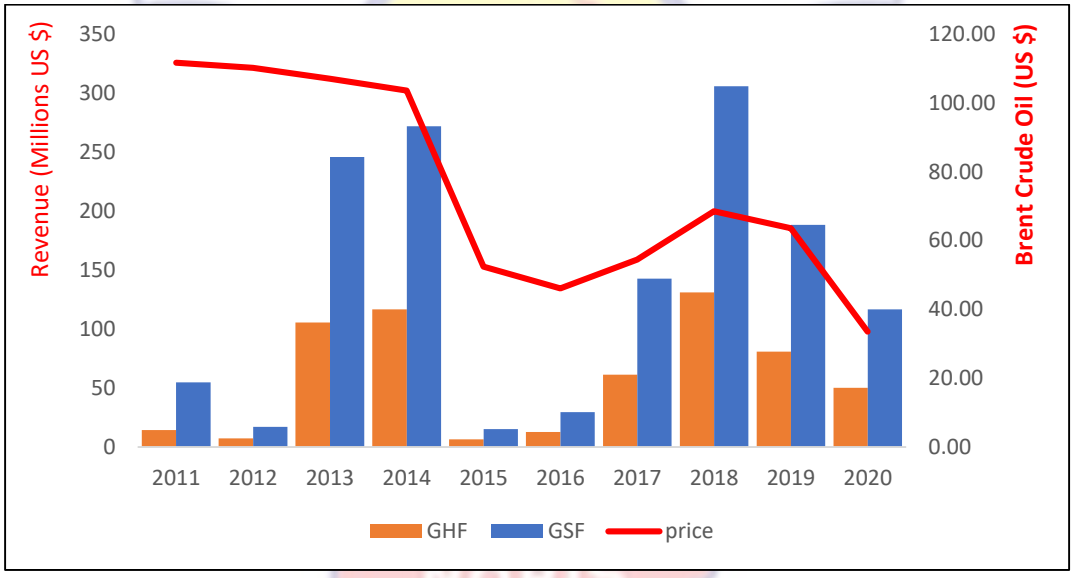


Figure 24: Effect of price variations on allocations to the GSF and GHF

Source: Author's Construct (2021)

In sum, Sections A and B looked at the various sources and allocations of petroleum revenues in Ghana between 2011 – 2020. Section B is distinguished from Section A because the former analysed these revenue sources and allocation mostly with respect to crude oil price fluctuations. The

regression analysis was to examine the extent to which prices and volumes of production influence the variations in petroleum revenues. The significant impact of crude oil prices and production volumes on petroleum revenues made it possible to attribute to a large extent, the variations in the sources and allocations of revenues to variations in crude oil prices especially and also production volumes. However, other factors such as differentials between benchmarked and actual revenues, allocations to GNPC as well as ministerial discretions also partly influence the allocation of petroleum revenues in Ghana. With this information, a more qualitative approach through stakeholder engagement was adopted to enrich the study.

SECTION C

Evaluating Stakeholders Perspective on Petroleum Revenue Management

Overview

The general perception of stakeholders was evaluated on a 5-point Likert Scale. Out of the 16 participants (Stakeholders) earmarked for the study, 14 provided responses. This represents a response rate of 87.5%. Regardless of the number of follow-ups, the author, being bounded by research ethics, could not coerce a participant who could not participate in the study for one reason or the other (Xu et al. 2020). As a result, data used for objective three were those obtained from the 14 participants. Although their information could have helped broaden the scope, the absence of the 2 stakeholders did not significantly alter the findings of the study because as supported by Nielson and Knardahi (2016), the average response rate for a large sample size (100 and above) is 52.7%. Conversely, for a smaller sample size (20 and below), as in the case of this study, Kaplowitz et al, (2004) suggests that the response rate should be 80% or

greater. This then justified that with an 87.5% response rate, the data available was useful for this analysis.

The discovery of oil comes with lots of expectations. If the past and experiences in the mining sector are anything to go by, then Edjekumhene et al. (2019) believe that could potentially raise individuals' understanding of resource revenue management, influencing their attitudes and expectations toward oil and gas revenue management. Table 9 shows how stakeholders responded to various questions concerning their level of agreement about petroleum revenue management in Ghana.

Table 9: Stakeholder Perception on Petroleum Revenue Management

Statement	Mean	Std. Deviation
1. Ghana's PRMA has performed according to my expectation since its passage in 2011.	1.93	.475
2. Ghana's fiscal system encourages upstream participation while increasing the profitability margins of the players.	2.14	.363
3. The PRMA has ensured adequate transparency and accountability in the management of petroleum revenues in Ghana.	2.08	.616
4. The current petroleum management framework of Ghana favours International Oil Companies (IOCs) than the Host Government (HG).	2.57	.938
5. The current petroleum management framework of Ghana favours the Host Government (HG) than the International Oil Companies (IOCs).	3.21	.699
6. GNPC's capacity should be built in order for it to be competitive in upstream business to increase its stakes to optimise revenue generation.	1.93	.475
7. The PRMA should be amended to meet changing circumstances in the industry.	1.93	.475

Mean interpretation: [1.00-2.49, Agree (High)] [2.50-3.49, Neutral] [3.50+, Disagree (low)]

Source: Author's construct (2021)

Out of the 14 participants, 11(78.6%) agreed and 2(14.3%) strongly agreed that they are satisfied with how Ghana has managed petroleum revenues over the years. One stakeholder, representing 7.1% was, however, neutral about how the performance has been. Overall, the level of agreement in relation to the performance of the PRMA meeting the expectation of stakeholders was found to be high which corresponds to the mean and standard deviation values of 1.93 and 0.475 respectively. This seems to coincide with a decade-long finding by Amoako-Tuffour (2011) who wrote that the PRMA has among others responded to the demands of public expectations.

The second question put forth was to appreciate the perception of stakeholders on the fiscal regime in Ghana. The fiscal arrangement at the upstream plays a crucial role in government access to revenues and management and use by extension. This varies from country to country (Luki, 2016) and implementing a certain fiscal regime is a decision that is influenced by some variables (Ocran et al. 2019). Thus, the study sought to understand stakeholders' understanding of the fiscal regime and its ability to encourage investments. The study finds that the majority of the stakeholders 12 (85.7%) agree that Ghana's fiscal regime encourages upstream participation and ensures that players make some return on their investment. A mean of 2.14 and a standard deviation of 0.363 implies that most of the stakeholders expressed satisfaction with the ability of Ghana's fiscal regimes in attracting investment and encouraging upstream business. This is in line with what Samanhyia and Samanhyia (2016) highlighted that fiscal regimes enshrined in Ghana's Petroleum Agreements (PAs) were progressive and attractive to encourage the IOCs to invest their huge but scarce capital.

Also, participants provided responses on accountability and transparency in the management of petroleum revenues in Ghana. More than half 11(78.6%) agreed that indeed there has been accountability and transparency in the management of revenues in Ghana while a little over one-fifth 3 (21.4%) were however neutral in their response. Such responses are reflected in the mean of 2.08 and a standard deviation of 0.161 signifying that a greater number of responses is clustered around the agreement.

Most literature around transparency and accountability emphasises the extent to which transparency has been achieved over the years. However, the accountability side is yet to come to terms with the level of transparency. Aryeetey and Ackah (2018) in that regard revealed that accountability in the collection of revenues has been poor even though transparency has been high. Stakeholders engaged in this study however agree to a greater extent that transparency has been ensured by the PRMA. To sustain and enhance transparency and accountability in the usage of petroleum revenues, PIAC upholds its mandate as provided for by section 52 of the PRMA (PIAC, 2020).

Again, stakeholders responded to questions on how Ghana's fiscal regime either favours the IOCs or the government. Finding a balance in a fiscal regime to ensure a win-win situation for both investors (predominantly foreign investors) and Host Government (HG) has always been the motive behind most fiscal regimes. HGs are usually the owners of the natural resource but are also handicapped in terms of capital and the capacity to exploit their resources (Abraham, 2017). This then calls for the involvement of investors with the required capital and capacity to commercialise the natural resources for the HGs (Abraham, 2019). The government then go into an agreement with these expatriates and are obligated to ensure that the IOCs can recover their cost and

make some returns. The fiscal elements thus spell out how both parties will be satisfied at the end of the day. In responding to the statements, half 7(50%) of the participants were neutral in terms of whether the current fiscal regime favours the IOC or the HG. Additionally, over a third 5(35.7%) of the participants disagreed that the petroleum revenue management framework favours the HG than the IOCs.

The divergent views expressed by stakeholders on the issue could be explained by the mean of 2.57 and the standard deviation of 0.938. This means that participants had a neutral view on whether the HG or IOCs is more favoured by the petroleum revenue management framework. Intuitively, this could be explained as petroleum revenues, being a function of the fiscal system. Thus, it is the fiscal system that to a large extent can either be for or against the HG/IOC and not the petroleum revenue management framework – the PRMA for that matter. A similar situation is mirrored in the responses provided to the statement that the current petroleum management framework favours the IOC than the HG. Though half 7(50%) agreed, a third 3(21.4%) of the participants were neutral while the same disagreed on the issue. In the end, a mean of 3.21 and a corresponding standard deviation of 0.699 categorises the overall stakeholder perception as neutral.

Furthermore, the position of the participants on the capacity of the Ghana National Petroleum Corporation (GNPC) was evaluated. It is through GNPC's participation that the state receives revenues in the form of CAPI – the major source of oil revenue. About 92.9% (13) of the participants agreed that the corporation's capacity has to be built. This in effect is expected to enhance the capability of GNPC in the upstream business. This further supports the study by Samanhyia and Samanhyia (2016) that the development of GNPC's

capabilities is unavoidable if it is to increase its working interest in future discoveries. The success of the corporation in the upstream sector will to a large extent justify the over $2billion it has received over the years from petroleum revenues.

A mean of 1.93 and a standard deviation of 0.475 is because participants expressed a higher level of agreement that GNPC's capacity should be built. As evident in literature, the States' NOC should be resourced and enhanced for it to be competitive in the upstream business (Abraham, 2017) and aspire to raise global standards and serve as a catalyst for national development (Suleman & Zaato, 2021).

Lastly, the views of the stakeholders in terms of amending the PRMA after a decade of implementation were also assessed. Regardless of the successes chalked over the years in terms of petroleum revenue management in Ghana, there still are some issues to iron out to better enhance the framework. As a result, about 92.9% of the participants alluded to the defects in the PRMA and agreed that some form of amendments be made to accommodate changes in the industry. The perception of participants' agreement to amending the PRMA is statistically explained by the 1.93 mean with a corresponding 0.475 standard deviation. This coincides with earlier calls by Ackah (2020) for the amendment of the PRMA.

Perspective of Stakeholders on Petroleum Revenue Management

This section analyses the qualitative bits of the perspectives of 14 key informants whose responses were elicited using a semi-structured interview approach. Through thematic analysis, their ideas, knowledge, experience, views and expectations of petroleum revenue management in Ghana within the period under study is categorised and explained below.

Institutional role in Petroleum Revenue Management in Ghana

To meet its mandate of effectively regulating the collection, allocation and management of petroleum revenue derived from upstream-midstream petroleum operations, the PRMA has in place key government institutions and agencies to assist in delivering its mandates.

It has been established in the literature (Mehlum et al, 2006; Frankel, 2010; Torres et al. 2012; Holden, 2013) that institutions play a critical role in ensuring that a resource-blessed country enjoys the maximum resource. Recently, a study by Armstrong (2019) also affirmed the functional role of institutions in transforming natural resources into riches and hypothesised that countries with weak institutions are often "cursed" rather than blessed (Armstrong, 2019). Following this premise, the study sort to find out the various roles performed by some of the key institutions related to the PRMA. The following paragraphs highlight the role of key institutions and how their activities influence the objectives of the PRMA.

The Bank of Ghana (BoG)

The Central Bank of Ghana is one of the key institutions mandated to ensure the effectiveness of the PRMA. This section discusses some of the key roles of the BoG according to the data analysed.

a. BoG as an Account manager

BoG's role is to help in the collection and distribution of the oil revenues and then report on it to the Ministry of Finance and Controller and Accountant General. The main job then begins and that is where the BoG serves as a Portfolio Manager; managing the GSF and GHF.

b. BoG liaises with other institutions in managing oil revenues

If there is a delay in the IOC making payment on the stipulated date, BoG notifies GNPC to get in touch with the IOC and if there is any levy that is to be levied, it is done accordingly, and they pay to the PHF.

c. BoG publicly provides information on petroleum revenues

BoG also have information that is published online and on the Ministry of Finance's website which is also presented to parliament on the date of the gazette publication (BoG Key informant, 2021).

In a broader spectrum, the BoG liaises with other stakeholders of petroleum revenue management in Ghana such as GNPC, GRA, Ministry of Finance and others in disbursing petroleum revenues. Also, it aids in ensuring compliance with the stipulations of the PRMA. In reference to section 3 subsection 4 of the Act, the BoG ensures that defaulting companies comply with the PRMA in terms of timely payment of revenues and subsequent penalties to be levied where necessary. Additionally, the BoG, in conformity with the Act ensures some form of transparency and accountability in the management of petroleum revenues through the publication of reports on the Ghana Petroleum Funds.

Ministry of Finance (MoF)

Another key state body mandated to ensure the smooth implementation of the PRMA is the Ministry of Finance. More also, the ministry is empowered by the PRMA to support in the allocation/distribution of funds into designated accounts in compliance with the PRMA.

a. The ministry collaborates with other institutions to manage funds

There are various provisions in the Act that defines how the ministry manage the funds. The ministry is guided by the Act in transferring

> *or sharing money to the various accounts.* N*ormally, when the Minister is presenting a budget statement, there's a portion called petroleum reports that provides details on all the projects that received funding from the ABFA, total amounts received for the ABFA, how much was spent, how much is left, and on which projects* (Key Informant, MoF).

From the above responses, it can be deduced that the Ministry in collaboration with other stakeholders, undertakes various activities and per the Act, is mandated to ensure among others, the transparent and sustainable management of petroleum revenues for the benefit of the citizens of Ghana. Also, the Ministry, like the BoG, is influential in ensuring transparency in the management and use of petroleum revenues

Ghana National Petroleum Corporation (GNPC)

Like most of the PRMA affiliated institutions, the GNPC also has the roles that it performs in ensuring that petroleum revenue and specifically its collections and allocations are done in such a way that the integrity of the Act is upheld. GNPC, unlike the other institutions, is particularly known for its role in upstream operations for holding the states' Carried and Participating Interest (CAPI). According to the Act, it is expected to receive not more than 55% of its Carried and Participating Interest (CAPI).

As a key stakeholder in petroleum revenue management in Ghana, the NOC provided insights on key aspects of its operations and mandates about petroleum revenue utilisation and use in Ghana. While responding to how fiscal system favours revenue optimisation in Ghana, the Corporation emphasised as below;

a. GNPC represents the state in petroleum agreements

Ghana's fiscal regime is a hybrid of the Royalty-Tax concessionary system and the Production Sharing Contractual system. This is to ensure that Ghana retains, to the extent possible, good elements of both systems (Key informant, GNPC).

As part of its revenue optimisation strategies, GNPC reports that;

b. GNPC adopts revenue optimisation mechanisms

Ghana launched a competitive bidding process in 2018 to increase competition and enhance transparency in the allocation of blocks and the attraction of competitive fiscal terms for the blocks (Key informant, GNPC)

It is quite clear the GNPC is consolidating its operatorship drive for efficiency and financial independence. Notably, the Corporation is currently expediting efforts in terms of exploring both in-land and frontier basins and is expected to go a long way to de-risk those basins and increase national reserves and revenue to the state in the medium to long-term.

Arguably, GNPC as an operator is in the best place to augment revenue to the State through;

an increased additional interest and commercial interests in various petroleum operations as well as effective partnership with locals (Key informant, GNPC).

Public Interest Accountability Committee (PIAC)

PIAC, as an independent government institution plays a key role in the effective management of petroleum revenues in Ghana. From the analyses, the response below summarises PIAC's role more broadly;

a. Semi Annual and Annual Publications of petroleum revenue data

There is a semi-annual and annual publication of its statutory reports on the petroleum revenue management and developments in the industry. It also makes recommendations on the petroleum revenue management and calls out specific stakeholders on their specific actions.

b. Occasional stakeholder engagement and recommendations

Again, roundtable discussions are held with stakeholders on various aspects of the Act's compliance. The Committee's recommendations contained in its reports are also sent to Parliament and the Executive for the necessary action to be taken. PIAC also creates awareness of issues arising from the management and use of petroleum revenues during public engagements (Key Informant, PIAC).

The above response highlights the role of PIAC in terms of enforcing and ensuring adherence to the mandates of the PRMA and also the extent to which it has ensured transparency and accountability over the years.

To help increase petroleum revenue received by the government and ensure efficient utilisation of petroleum revenues;

c. PIAC ensures monitoring and compliance with the ACT

The Committee has called for stakeholders to speed up processes to trigger the Additional Oil Entitlements as another source of petroleum revenue for the State. Efficient utilisation is ensured through an independent assessment of selected projects and programmes funded with petroleum revenues. The Committee is involved in continuous monitoring of compliance with the Act by the government and other relevant stakeholders (Key Informant, PIAC).

The slow pace in acting on the committee's recommendations by stakeholders appears to militate against its effectiveness (Graham et al.2020). To be able to function as expected, PIAC looks forward to a;

Speedy action (being taken) *on its recommendations by Parliament and the Executive* (Key Informant, PIAC).

The ABFA and Monitoring and Evaluating of ABFA Funded Projects

Section 18 of the Petroleum Revenue Management Act, 2011 (Act 815) as amended specifies that;

1) The ABFA from petroleum revenue shall not be more than 70% of the Benchmark Revenue.
2) The exact percentage of the Benchmark Revenue which shall be allocated annually to the ABFA shall be guided by a medium-term development strategy aligned with a long-term national development plan, absorptive capacity of the economy and the need for prudent macroeconomic management.
3) For each financial year, the percentage of the Benchmark Revenue allocated for the ABFA shall be approved by Parliament as part of the national budget.
4) The spending allocation determined under subsection (1) Shall be reviewed every three years with the first review to occur before the commencement of the 2014 financial year.
5) The review shall be conducted by the Minister considering the development needs as well as the absorptive capacity of the economy and cognisant of the need to maintain macroeconomic stability.
6) Any proposal changes following the review shall be subject to ratification by a resolution of parliament supported by the votes of not less than two-thirds of the members of parliament.
7) The ABFA may be used as collateral for debts and other liabilities of Government for a period of not more than ten years after the commencement of this Act.

In addition to the above, section 21 of the Act specifies the uses of the ABFA. And it states that "the Annual Budget Funding Amount is part of the national budget and its use and expenditure are subject to the same budgetary

processes that are necessary to ensure efficient allocation, responsible use and effective monitoring of expenditure". It further states that among others; the use of the annual allocation of the ABFA shall be guided by a medium-term expenditure framework aligned with a long-term national development plan approved by parliament. According to the Ministry of Finances' representative;

a. The National Development plan influences ABFA allocations

The framers of the Act envisaged that there is going to be a national development plan. The national development plan will then determine how or where to invest or spend the ABFA money (key informant, MoF).

Gyampo, (2016) is of the view that the ABFA is not satisfactory and may not achieve the intended development impacts due to the absence of a long-term development plan. In terms of evaluating the usage of the ABFA, section 48 of the PRMA principally tasks the Minister of Finance to provide a status report on the utilisation of ABFA monies;

b. The finance ministry publicly provides report on the ABFA

The annual reports of the petroleum funds and reconciliation reports provide details on these projects that are funded by the ABFA. This helps to be able to provide the status reports on where the projects have reached and then monitor the project.

c. Routine visit to project site to monitor the status of projects

The ministry normally team up with a Regional Coordinator, Coordinating Officers or Reginal Minister and go to the districts as well to visit the projects. So it is a monitoring and evaluation system (Key Informant, MoF).

According to the response from the key informant from the ministry of finance, the monitoring and evaluation system ensures value for money for the ABFA funded projects.

Considerations for selecting the Priority Areas

> *Once the money (petroleum revenue) is paid into the ABFA account, then the Act triggers what is called* ***priority areas*** (Key Informant, MoF).

When it comes to selecting the priority areas in the absence of a national development plan, 4 out of the 12 priority areas will be selected. However, the Act is not specific on the considerations to be made before projects in these areas are embarked on. Responding to the considerations made for the choice of the four priority areas, the finance ministry responded as below;

a. Government's flagship project influences the priority area selection

> *The ministry is guided by several considerations. For example, the one that was done in 2020, there were several factors. Amongst them is government's Ghana Beyond Aid Vision and the Coordinated Programme of Economic and Social Development Policy as well as the Medium-Term Development Plan. Once the four priority areas are selected, then the next three years, that is where the ABFA money is spent. After the three-year term, another four priority areas are selected. It is possible that these considerations may change and therefore, the next three years, other priority areas previously not considered as a priority may become a priority area* (Key informant, MoF).

The above tends to suggest that now, the criteria for selecting the priority area are based on the current government's objectives and visions for the country. This does not seem to go on well with stakeholders including CSOs, and individuals from academia and industry.

b. The priority area selection lacks empirical analysis

> *The PRMA has an objective and it is not just select projects and pay for them because the objective is to promote diversification to fast track the growth. So at the end of three years, some analysis should be done. Unfortunately, that is not done. So whoever comes, just decide to select*

> *this and most of the time based on the party Manifesto. One challenge is that the manifestos are not guided by any empirical analysis* (Key informant, Academia/Industry player)

The selection of priority areas, though backed by the PRMA, is however, subtle in the choice of projects in these priority areas. Since 2011, the priority areas have been selected arbitrarily based on the promises in the manifesto of the party in power (Ackah, 2020). According to some participants, these create an avenue for inefficiencies and misappropriation of funds. To an extent, some stakeholders are of the view that political consideration takes centre stage in selecting the priority areas. Some are of the opinion that;

c. The priority area is subject to political influence

> *It leaves that open to the government in power to determine what areas are critical to follow in the absence of the national development plan. There are no set criteria like one should select this or that. What we should be advocating for is a National Development Plan that gives a roadmap that we want to move from point A to point B at this time then we can be able to measure. But until then, we will not be able to assess the effectiveness of the expenditure that is made in the areas that are selected to spend on them* (Key Informant, ACEP).

This is in line with the study by Stephens (2019) that vehemently suggests that governments have failed to adhere to restricting themselves to only four priority areas, often smuggling a laundry list under an umbrella and also making it easy for funds to be misappropriated. This brings to perspective what Graham et al. (2020), termed 'political patronage' - a system that weakens democratic institutions and fosters corruption and lack of transparency, all of which hurt the country's resource governance.

Transparency and Accountability in Petroleum Revenue Management

One of the key objectives of the PRMA is to ensure transparency and accountability in the management of petroleum revenues in Ghana. It is the expectation that the various stakeholders related to the PRMA such as government institutions and the IOC and all who are concerned adhere to the dictates of the Act. The ministry of finance, as part of its roles, provide reports on their activities relating to receipts and use of petroleum revenues. This, according to the ministry, is a way of ensuring transparency.

a. The ACT has enhanced transparency in managing revenues

There is that transparency in terms of the receipts and management of ABFA. Everything is defined by the law and the ministry go by the Act. Because whoever needs information on it can go to the report. It is published on the ministry's website and gazette (Key Informant, MoF).

Though the Ministry and related state institutions such as the Bank of Ghana and GNPC provide 'timely' report on petroleum revenues as a way of demonstrating transparency, some of the experts consulted ascribe to the fact that the PRMA to a larger extent has ensured transparency in revenue management, there are some critical areas of concern and it borders mainly on the accountability.

b. The Accountability system is ineffective

What the law lacks is accountability. If someone is to do this but refuses, what happens to the person? Nothing! And because of that people at times do what they want with the Act. So that is the fundamental issue. The PRMA has largely ensured transparency of revenue management and accountability. However, grey areas regarding the treatment of unspent revenues, and ministerial discretion among others remain (Key Informant, Academia/Industry Player).

Not just experts from academia but also CSOs are raising concerns about the accountability side of petroleum revenue management in Ghana. Some said that;

> *To the extent of transparency, it (The PRMA) is doing so well. Ghana has distinguished itself from neighbouring countries. At least Ghana is able to track how much we receive. The challenge, however, is the accountability components. How do we ensure that it is spent on what we ask that it is spent*? (Key Informant, ACEP).

The above responses capture how the PRMA has performed over the years in terms of transparency and accountability. So far, the transparency side to a greater extent has been satisfactory but the accountability aspect of revenue management is still leaving room for critique as below;

1) *If you watch the whole petroleum revenue management value chain, going beyond the collection, there are challenges at the accountability end (Key Informant, ACEP).*
2) *PRMA has largely achieved its objectives; one of which is transparency. But it has somehow failed in ensuring accountability. The law has not empowered PIAC enough to take further action like prosecution. So answerability and enforcement as key aspect of accountability is largely not achieved* (Key Informant, GIZ).

The response reflects earlier studies that the weaknesses in these institutions justify calls for institutional strengthening by Ackah et al. (2020) for PIAC to have powers of a Commission so that it may do more than only monitor revenue, engage citizens in debate, and perform independent assessments of the use of petroleum funds (Sefa-Nyarko et al. 2021).

Discretionary Power of the Finance Minister on Capping the GSF

Section 9 of the PRMA (815) as amended (893) establishes the Ghana Stabilisation Fund (GSF). This fund, according to the Act;

'*is to cushion the impact on or sustain public expenditure capacity during periods of unanticipated petroleum revenue shortfalls'*.

In terms of withdrawals from the stabilisation fund, section 12 specifies that;

1) where petroleum revenue collected in any quarter falls below one-quarter of the ABFA for the financial year, withdrawals may be made from the GSF.
2) The allowable amount to be withdrawn shall be the lesser of;
    a. 75% of the estimated amount of the short-fall for that quarter, or
    b. 25% of the balance standing to the credit of the GSF at the beginning of the financial year.

The PRMA also mandates that transfers out of the GSF shall **only** be done to alleviate shortfalls in actual petroleum revenues per various subsections in section 12. In doing so, the finance minister is empowered by the Act to cap the GSF when economic conditions warrant so. According to the information provided by the Finance ministry;

a. There is a justification for the finance minister to cap the GSF

The Finance Minister has the power to cap the Ghana Stabilisation Fund (GSF). However, that power has to be approved by Parliament. In other words, it has to be approved by the people of Ghana. Recommendation or that amount that a minister recommends is based on macroeconomic conditions at a particular time (Key Informant, MoF).

The PRMA makes room for capping, however, there have been concerns with how it is done over the years. Gyeyir (2019); Stephens (2019) and Ackah (2020) have expressed some form of reservations against the discretionary power of the finance minister on the stabilisation fund. They oppose the ministerial discretions on withdrawals made from the stabilisation fund. Field

data, as elicited from key participants also corroborate the position of the earlier researchers.

b. There is complexity in the capping mechanism

1. *There's an issue and it is not the capping. The issue is how it is done. Who determines the amount? Why that amount? And who assesses that we are capping it to say 100million, if oil price fall by say 2%, that can cushion government budget?* (Key informant, Academia/Industry player).

The discretion of the minister raises concern and industry players have critiqued and suggested a plausible solution to what they consider 'an abuse' of the stabilisation fund. Below are some of the suggested solutions;

2. *If we are going to cap, there should be a guide. If based on the projections of the benchmark price, oil price is going to fall by 10%, then the existing cap should not be below the expected shortfall. It doesn't mean we can't cap, we can but it shouldn't be at a discretion* (Key Informant, Industry/Academic player).

Whereas some participants are concerned about how the capping itself is done, others were concerned about the discretionary power granted to the Minister of Finance by the PRMA.

c. The capping is a weakness of PRMA

*The problem here is not whether the capping is illegal or not but rather the allowance of the capping in the first place. The PRMA allows you to do so now, you have to get it to Parliament for parliament to legitimise what you've done. But if the PRMA does not allow you to do that, you wouldn't do that. What we see is a weakness of the PRMA. So it's not about the people (*Key Informant, Industry/Academic player*)*

These responses support earlier findings from Adam (2017); Gyeyir (2019) and Suleman and Ennin (2021) that there are defects even within the PRMA which need to be addressed as a matter of urgency.

Dealing with Crude Oil Price Volatilities and Considerations for Hedging

Stella et al. (2019) find that globally, crude oil prices fluctuate over time and such fluctuations eventually affect the revenues derived from the sale of crude oil. The frequent variations in crude oil prices leave players in the petroleum business with little or no option than to put in place measures to deal with unanticipated revenue falls as orchestrated to a large extent by crude oil price declines. Several financial instruments and contractual agreements such as forward, future and options contracts and among others have been used by participants in the oil and gas industry to hedge their exposure and minimise their risk to the volatile nature of oil prices (Luciani, 2011). For instance, according to Institute for Fiscal Studies (2014), Tullow Oil and Kosmos Energy – two giant oil producers in Ghana – have effectively used hedging to deal with oil price volatility risks.

In Ghana, the impact of crude oil volatilities has been felt across the petroleum sector over the years. Trends in crude oil prices as well as revenues from petroleum to an extent underscores the impact of price volatilities on petroleum revenues. In a relatable situation, the upsurge of the Covid-19 pandemic and the cascading effect on the global economy in general and oil market in particular through price reduction, Ghana's 'share' of the commodity price fall translated to a tune of about 30% reduction in oil revenues.

Against this background, the study engaged stakeholders to appreciate how Ghana deals with crude oil price volatilities and ascertain the extent to which hedging is being considered for prudent and sustainable petroleum revenue management.

Ghana's PRMA has in place measures to curb the impact of volatilities. Here are some supporting statements to that effect;

a. The GSF and GHF as a hedge

1. *The main purpose of establishing Stabilisation Fund is to support the budget in terms of volatilities* (Key informant, MoF).
2. *The establishment of the Stabilisation Fund is a mechanism to cushion government expenditure capacity in periods of significant fall in crude oil prices below the expected benchmark price used for budgeting in a particular fiscal period* (Key informant, GNPC).
3. *It is because of the volatilities in petroleum revenue that is why the stabilisation fund was added to the framework. You cannot hedge the whole fund, so a certain percentage is kept, that when times are hard, we can fall back on* (Key informant, ACEP*).*

b. Energy transition could influence Ghana's hedging strategy

Ghana used to hedge her revenue against unforeseen situation but as a matter of policy, it was later changed. Now industry players think it (hedging) is necessary as Energy transition and other factors could potentially affect future oil revenues (Key informant, GIZ).

Ghana has been reluctant in embarking on a full-scale hedging due to several reasons. Some of the participants were frank in admitting that; hedging is indeed one of the mechanisms to manage volatilities. However, it has its own challenges which include major losses (Luciani, 2011). Some stakeholders are of the view that Ghana is better off using the benchmark revenue as a risk managing instrument and that explains why Ghana is currently not going into the likes of forward and futures contracts. The benchmark revenue then becomes an alternative.

c. Hedging is risky; the benchmark revenue is an alternative

1. *There is the need to always think of how to secure revenues and hedging is one of the proposals that keep coming. Hedging is like a lottery. So, is a risk, you could win or lose* (Key informant, MoF)
2. *The GSF is a hedge against volatilities* (Key informant, ACEP).
3. *Another mechanism (to hedge) is the benchmark revenue, which*

Ghana is using (Key informant, Academia/Industry player).

These responses then largely expatiate on the role of the GSF in the entire petroleum revenue management framework. It is a risk mitigation tool that has been used over the years in securing petroleum revenues against price volatilities. When it comes to considerations for hedging the entire petroleum revenues against oil price fluctuations, evidence points to the fact that proposals have been received by the ministry of finance. However, a concrete decision is yet to be made.

d. There are proposals for full scale hedging in Ghana

Proposals have come from companies which we are still considering and as to whether we will do it or not, management will decide. Industry dynamics at any point in time will determine if hedging will be appropriate to maximise the revenues generated from crude oil sales (Key informant, MoF).

With inference from the above analysis, it is evident that indeed Ghana's petroleum receipts have been affected in one way or the other due to unstable oil prices. Evidently, the stabilisation fund has consistently been relied upon during times of unanticipated revenue declines (PIAC, 2020). The fund as a risk mitigation strategy is stipulated in the PRMA. Large scale hedging is yet to be adopted in Ghana even though the finance ministry has received several proposals to hedge petroleum revenues against future price fall which will eventually impact petroleum revenues to the state. It thus tends to suggest that the benchmark revenue is 'perfectly' performing its risk mitigation function and as a result, the global crude oil volatilities cannot be the basis on which Ghana will implement an additional risk mitigation strategy.

Decentralising the Allocation of Petroleum Revenues for Development

The PRMA mandates that all petroleum revenues be deposited in a centralised account famously known as the Petroleum Holding Fund (PHF). Further disbursements are made from this principal account held at the bank of Ghana. Funding for the ABFA project(s) in any region/district is disbursed at the national level. Petroleum revenue allocation and disbursement are centralised (Sefa-Nyarko et al., 2021) with the finance ministry and the Bank of Ghana as key actors.

Unlike the petroleum sector, the mining sector of Ghana has made specific funds available for the development of mining communities. This is institutionalised by the Mineral Development Fund (MDF) Act 2016 (Act 916). Section 16 of the MDF Act establishes the Mining Community Development Scheme to facilitate the socio-economic development of communities in which mining activities are undertaken and that are affected by mining operations (Mineral Development Fund Act (Act 916), 2016).

Against this background, the study as part of its objectives sought to find out how Oil Producing Municipal/District Assemblies (OPMDAs) in Ghana have directly benefited from oil revenues. OPMDAs, as adapted from Influence (2017) in this context refer to those municipals/districts in whose territory oil is discovered and from where it is exploited. In Ghana, such OPMDAs were identified as Ahata-West Municipal Assembly, Jomoro Municipal Assembly and Ellembelle District Assembly. Ghana's 3 oil-producing fields, that is Jubilee, TEN, and Sankofa-Gye-Nyame are all located within these OPMDAs. Key informants within these districts/municipals comprised of Municipal/District Chief Executive, Town and Country/Physical Planning Officers and Account/Finance Offices for these OPMDAs.

In responding to questions on how petroleum revenues have been utilised in the OPMD, it should be noted that all 3 informants in the OPMDAs confirmed that indeed there has not been a single disbursement/allocation of petroleum revenues directly from the Government to their respective assemblies. This, they consider a challenge. Here are responses to buttress such a claim;

a. **The district assemblies are not allocated petroleum revenues**

1. *Those in the mining communities, Sehwi Wiaso, Babiani, Tarkwa, Bogoso, Obuasi, and others, have the Mineral Development Fund but with the petroleum sector, it is not like that*.
2. *The mineral royalties comes every time but for petroleum revenues, the municipal is yet to receive a penny.*
3. *There are no records of petroleum revenues disbursed to the district. Oil is produced on the shores but we don't benefit from the revenues. What we usually get is from the mining companies* (Key informant, OPMDA).

Here, it tends to suggest these OPMDAs do not get direct funds from petroleum revenues. By extension, they are closer to the oil but miles apart from oil revenues. Whereas mining communities directly benefit from mineral royalties, the case is different with oil-producing communities. Additionally, the key informants for these OPMDAs responded to how they benefit from petroleum production in their communities. The responses are as below;

> *The benefit that we normally receive is that the International Oil Companies such as Tullow, Aker including GNPC undertake some development activities including the construction of roads and they sometimes award scholarships to the indigenes within the municipality. They are doing it because of the benefit they receive and as part of their Corporate Social Responsibilities (CSR)* (Key informant, OPMDA).

The above is evident in Oppong (2016) who ascertained that visible CSR initiatives can be found in education, extractive communities, sports, and

coastal communities near offshore oil and gas production facilities. The activities of the Oil companies in these OPMDAs have their consequences on the indigenes and the Assemblies at large.

In terms of community expectations from the production of oil in their territory, the agitations are yet to be heightened because of the role the oil companies play in their lives. Participants were asked about the expectations and sense of entitlements among the indigenes within the Assemblies. Their responses were;

b. There is community expectations in the oil producing assemblies

For now, because of what they have seen around – the IOC's giving the indigenes scholarships and taking them to school – and all that, so for now the agitation hasn't come, they are quiet for now. The Assembly is however concerned at least even if they could pay something small for development (Key informant, OPMDA).

This suggests that the CSR operations within the communities have been well received by the indigenes and appear to be a substitute in one instance and a complement in another for government direct petroleum funded project. Ablo (2020) found that in some cases, petroleum companies adopt CSR strategies to build community trust to reduce the possibility of a social upheaval resulting from the restricted trickle-down of resource benefits to society. The subtle issue here, however, is similar to the findings of Influence (2017) who agrees that both the long and short-term relationship is likely to be affected in communities where communities see oil companies as a substitute for government. Even though the indigenes largely are not worried about direct government disbursement of oil revenues to their localities, the Municipal and District Assemblies on the other hand feel they are being denied part of the oil revenues.

The concern is from the assembly and not the people. For now, there hasn't been any agitation that the government should bring them money. They are interested in development and they've seen roads being constructed (Key informant, OPDMA).

The activities of the oil companies and their effect on the people and the assemblies provide justification for the Assembly's call for decentralisation of the petroleum revenues.

c. Activities of the oil companies affect the community livelihoods

1. *You know this is (a) fishing community. They are aware of the impact of the IOCs operations on their livelihood. According to the fisherman, when we went out for the needs assessment, they said their catch has reduced because of the activities of the oil companies.* (Key informant, OPMDA).

A recent study by Andrews et al. (2021) reports a similar case where oil activities negatively impact the operations of small-scale fisher folks.

2. *The fisherfolks complain of reduced catch due to the offshore activities of the oil companies. Sometimes too the fishing nets interfere with some of the subsea installations including pipelines* (Key informant, OPMDA).

d. The Assemblies are affected by oil and gas activities

Occasionally you will see seaweeds being washed ashore. Unfortunately, it is the municipal that foots the bills for clearing such a frequent nuisance you see. So I think it will help if some portion of the petroleum revenues will be allocated to the district as it is done in the mining sector (Key informant, OPMDA).

From the above responses and analysis, it can be deduced that the various OPMDAs desire some percentage of the oil revenues to develop their assemblies and compensate for the challenges they face due to petroleum activities within their territories. Some studies conducted in the area of oil and gas activities and community expectation (Roe et al.2017; Ablo, 2020; Abudu

and Sai, 2020) alluded to the claim that the indigenes have higher expectations due to oil discovery. This study additionally finds that government machinery like the District Assembly in this instance, also feels entitled to some form of petroleum revenues as a result of the impact of oil and gas operations in these districts.

In 2007, the euphoria surrounding the discovery of oil was felt across the entire country and the country was expected to be on the path of development. It is therefore not surprising that the then president of Ghana, President Kufour was full of excitement and hopes following the discovery of oil. In an interview with BBC News in 2007, he said;

> "*...with oil as a shot in the arm, we're going to fly, going to really zoom, accelerate, and if everything works, which I pray will happen positively, so when you come back in five years you will see that Ghana truly is the African Tiger for Development."*

Many Ghanaians had similar expectations after oil was discovered but such expectations according to Plänitz and Kuzu (2015) are not baseless and unfounded because increased oil money is said to have fuelled the development of numerous oil-producing countries across the world. Additionally, the finding of oil has sparked a wave of positive expectations from governments and civilians alike, yet, evidence of conflict and problem-ridden resource-rich nations belies common wisdom, which indicates that resource abundance leads to socioeconomic benefits (Andrews, 2017). Taking into account the projected revenue and the number of available resources, it appears that meeting the public's expectations is unachievable. However, the Ghanaian government must ensure that oil income is used wisely and most openly and democratically

possible so that petroleum becomes a blessing to the Ghanaian people (Kastning, 2011).

Ghana's political system is a decentralised one but petroleum revenue allocation, unlike mining revenues, is still centralised. As supported by Cavnar (2008), ordinary Ghanaians benefit nothing from oil unless the proceeds are utilised to support decentralised, sustainable and equitable development. For this reason, some of the stakeholders interviewed including PIAC and Academia/Industry players are of the view that it is about time the government considers provisions to support the municipals and assemblies with some percentage of the oil revenues.

Considerations for the Amendment of the PRMA

The study to a greater extent sought to review petroleum revenue management in Ghana and among others proffer solutions to the challenges hampering the effectiveness of petroleum revenue management in Ghana. Most stakeholders expressed satisfaction with the performance of the Act so far. However, they identified key areas to consider for reforms. The following is a list of suggestions on some critical areas that stakeholders believe should be considered in amending the PRMA. Table 10 shows the responses provided by the participants for potential review.

Table 10: Areas to consider for Policy Reforms

Stakeholder	Section of PRMA (where applicable)	Key issues identified	Recommendation for reforms
Ministry of Finance	Section 12	Unspecified minimum balance to be kept in the Stabilisation Fund at a point in time.	*There should be a defined amount (a minimum balance) below which withdrawals cannot be made from the stabilisation fund.*
	Generic	Petroleum Revenues could be optimised should progressive models be considered.	*We should probably (amend) because some schools of thought think that the royalty regime is regressive so we should probably look at other models such as making it progressive. There is no need to change everything from maybe the hybrid to a concessionary or PSC.*
	Generic	Energy Transition is a concern.	*The long-term future of oil and gas is something that all the players are a bit concerned about. They are looking at how to get a hold of it. So that is one concern for now and we are looking at it.*
ACEP	Generic	Energy Transitioning is affecting investment in the oil and gas sector.	*There is the need to look at the competitiveness in the design of the fiscal regime.*
	Generic	Ineffective Cost Monitoring mechanism which reduces the taxable profit declared by the IOCs.	*The cost presented by the IOCs should be audited thoroughly by the state institutions.*
GIZ Ghana	Section 29	The Investment Advisory Committee's (IAC) advice to the finance minister not binding enough.	*The advice of the IAC should be binding on the minister of finance so that allocations to the budget through the ABFA be monitored well from bottom to top to ensure optimum utilisation.*
	Section 52	PIAC has not lived to expectation.	*PIAC needs further strengthening to perform its duties well.*

Table 10 continued

Academia/Industry Player	Generic	There is room for petroleum revenue optimisation.	*Ghana's fiscal system can be reviewed to allow for more stake beyond the current stake and allow GNPC to play their role effectively, so they manage higher shares in upstream on behalf of Ghana.*
	Generic	Political Interference at the National Oil Company	*GNPC needs strategic direction with strong technical leadership with less political control and interference.*
	Generic	Political influence affecting the operations of GNPC	*Ghana has some of the best people at GNPC but need to at least manage it more as a business entity than a political corporation.*
	Generic	Risk-averse attitude towards revenue optimisation	*Ghana cannot expect to benefit without taking risks. The government can reasonably estimate the risks to various petroleum projects and take risks.*
	Generic	Inadequate investment in the capacity of industry experts.	*Investing in knowledge of petroleum experts in the country together with capital outlay to develop the petroleum resources.*
	Generic	Lack of public confidence due to the disregard for due processes during a contingency.	*Even within contingency, due processes should be followed but the process can be shortened. But does not mean there is no process at all. So Ghana should be guided if there is no contingency, then these are the seven steps you follow. If there's contingency, these are the three steps and it helps to build up public confidence.*

*Generic: Applicable to the entire petroleum revenue management strategy in Ghana but not specified in the PRMA

Source: Author's Construct from Field Data (2021)

Chapter Summary

This chapter analysed data and discussed the results thereafter. Analysis was done with respect to each research objective. From objective one (1), secondary data obtained was analysed to quantify petroleum revenues that have accrued to the state from various sources as well as allocations made to and from various funds. The results show that while the CAPI represents the major source of revenue to the state, the ABFA on the other hand has been allocated most of all petroleum revenues to the state since 2011.

Also, in objective two, regression analysis was initially performed to statistically determine especially the extent to which crude oil price variations impact petroleum revenues. The statistical test proves that indeed crude oil price variations significantly influence petroleum revenues. This then paved way for further descriptive analysis on how crude oil price variations affect the individual sources of petroleum revenues as well as the allocation of petroleum revenues in Ghana.

Lastly, objective three (3) was analysed using thematic analysis of the responses provided by the stakeholders. Stakeholders expressed their views on petroleum revenue management in Ghana since 2011. This brought to light the successes chalked along the journey while identifying and making suggestions as to how best to improve the management of the revenues derived from petroleum resource exploitation in Ghana.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter provides a summary of the various key findings of the study as influenced by the data analysed in the previous chapter. The summary of findings will be followed by conclusions from the study. Lastly, some recommendations will be suggested to inform policy in the area of petroleum revenue management in Ghana.

Summary of Findings

Assessment of Petroleum Revenue Collection and Allocation Framework

In accordance with the PRMA, petroleum revenues are expected to be collected and allocated to respective accounts in a transparent and accountable manner to ensure sustainability for prudent management and use of petroleum resources for the benefit of all Ghanaians. With reference to secondary data obtained for the period under study (2011-2020) and reports on petroleum revenue reviewed before the commencement of data analysis for this study, key findings on petroleum revenue collection and allocation in Ghana are provided in the following paragraphs.

Ghana has since 2011 received a total of about US$6.55 billion from revenues from petroleum production. Table 11 shows the annual receipts.

Table 11: Annual Petroleum Receipts from 2011 - 2020

Year	Petroleum Receipt (Million US$)
2011	444.12
2012	541.62
2013	846.77
2014	978.89
2015	396.17
2016	247.18
2017	540.41
2018	977.12
2019	937.58
2020	638.64
Total Receipt	**6,548.51**

Source: Author (2021)

These petroleum revenues were sourced from multiple streams such as;

a. Carried and Participating Interest (CAPI) which has contributed the most to total petroleum receipts. It has contributed about US$3.81 billion since 2011 and this represents 58.1% of all petroleum receipts.

b. The second major source of petroleum revenue for Ghana is Royalty. Within the period under consideration, Royalty payments to the state amounted to US$1.64 billion which is about 25% of all petroleum revenues collected.

c. Another important source of revenue is the Corporate Income Tax (CITA) which has since amounted to US$1.08billion representing 16.5% of total petroleum receipts.

d. Surface Rentals is also a source of petroleum revenue for the state. It has so far amounted to US$8.27million and translates to 0.1% of total revenue received since 2011.

e. Lastly, revenues that accrue to the state include but are not limited to interest on funds in the Petroleum Holding Fund (PHF) and penalties on late payment. Over the years, revenues from these streams have accumulated to about US$16.09million which in percentage terms is 0.2% of all petroleum revenues accrued to the state during the period under consideration.

In terms of revenue allocation, the PRMA specifies the account and institutions that are to receive petroleum funds and how these funds are to be utilised. Key allocation of petroleum revenues for the period under study includes;

a. The Petroleum Holding Funding (PHF). This is the main account in which all petroleum revenues from all sources are temporarily deposited pending further distributions. It has been realised from the finding of the study that the total amount that has accrued to the PHF since 2011 is approximately US$6.55 billion while total petroleum distributions from this constitute US$ 6.52billion. This difference stems from interest earned from undistributed funds in the PHF (PIAC, 2017) and also interest on late payment of revenues (PIAC, 2020).

b. Out of the allocations made to the PHF, the Annual Budget Funding Amount (ABFA) has been allocated US$2.55billion which is about 39% of all allocations made from the PHF.

c. The Ghana National Petroleum Corporation (GNPC) has also received about US$2billion (31% of allocations made).

d. The Ghana Petroleum Funds, which comprises the Ghana Stabilisation Fund

(GSF) and Ghana Heritage Fund (GHF) have since 2011 been allocated about US$1.97billion (about 30% of allocations from the PHF). The GSF has been allocated US$1.39billion (21% of GPF) while the GHF has so far received US$585million (9% of GPF).

Responsiveness of Petroleum Revenues to Variations in Crude Oil Price

To statistically confirm the relationship between the price of crude oil and the volume of crude oil lifted on petroleum revenues, a simple linear regression model was employed to test the significance or otherwise of the two variables on petroleum revenues. The study found that the price of crude oil and volume of crude oil lifted were statistically significant at a 1% significance level. Having confirmed the impact of price variations on petroleum revenues, the descriptive analysis revealed the following.

a. Annual petroleum revenues receipts during the early phase of commercial oil production (2011-2014) increased even though there was a consistent marginal decline in crude oil prices for the same period. This negative pattern was however reversed after 2014 when petroleum revenues had a consistent direct relation with crude oil price to date.

b. In terms of the relationship between petroleum revenue allocation and the price of crude oil, the study finds that, since 2012, the price of crude oil and allocations to GNPC has exhibited a positive relationship. Again, since 2014, whenever the price is falling, more revenues are allocated to the ABFA to support the national budget. However, during periods of a windfall, more revenue is allocated to the GPF for subsequent distribution to the stabilisation fund and the heritage fund. This relates to the permanent Income Hypotheses.

c. Also, the relationship between price variations and allocations to the ABFA consumption expenditure and investment has fluctuated over the years. Between 2011 and 2020, a fall in crude oil price in 2012, 2014 and 2019 led to a corresponding increment in allocations to the ABFA. The remaining years saw a positive trend in the ABFA as global crude oil price fluctuates.

d. Allocations to the Ghana Petroleum Funds (GPF) has also been responsive to changes in oil revenues. It is worth noting that the relationship between allocations to the GPF and crude oil prices has not been obvious as allocations could increase or decrease irrespective of the direction of oil price change. Nonetheless, the pre-2016 years predicated a more direct relationship between the GPF and oil prices. This situation was replicated in the allocations to the GSF and GHF and that was expected as the two funds (GSF and GHF) together make the GPF.

Perspective of Stakeholders on Petroleum Revenue Management in Ghana

Ghana's petroleum revenue management framework comprises key state institutions and agencies with their specialised functions as provided for by the PRMA. This section provides a summary of the key institutions/agencies and relevant stakeholders on petroleum revenue management in Ghana.

Bank of Ghana

The role of the Central Bank in Petroleum Revenue Management cannot be overemphasised. Its role is key in critical areas such as collection, enforcement of compliance, transparency of petroleum receipts but not limited to management of funds notably the Ghana petroleum funds as expected of a fund manager. To deliver on its mandate and per the dictates of the PRMA, the

BoG provides the central account for which all petroleum revenues due the state is paid into. The BoG, together with the related agencies ensures that Ghana's petroleum entitlements are paid on time and, where payment delays, the appropriate sanction (as stipulated by the PRMA) are meted out to the respective defaulting entities. Through the publication of reports on petroleum revenues such as the Ghana Petroleum Funds and auditing, the BoG is said to be providing transparency in petroleum revenue collection in Ghana.

The Ministry of Finance

The Ministry, as an important state agency in revenue management, has over the years sort to function collaboratively in delivering on its mandates. The Ministry, like most institutions affiliated with petroleum revenue management in Ghana, acts on the provisions of the PRMA to ensure transparency and accountability in the management and use of petroleum revenues in Ghana. Over the years, the ministry and the finance minister have excessively been criticised by contemporary scholars of petroleum revenue management, Policy Think Thanks, Civil Society Organisations and others. The basis for such critiques mostly stems from suspected ministerial discretion in the choice of the priority areas and political arbitrariness on the capping of the stabilisation fund. In many instances, the ministry's response to such allegations does not seem to make the criticisms an issue worthy of consideration. The finance ministry is of the view that its actions are in conformity with the dictates of the PRMA and thus, it does not in any way contravene the Petroleum Revenue Management Act.

Additionally, the ministry opposes such claims because according to the ministry, parliamentary approval is sought before the stabilisation fund is

capped and all financial expenditure and transactions in relation to petroleum revenue management are published and gazetted with parliament as a key watchdog. From the perspective of the Finance ministry, parliament, represent the people of Ghana so once proposals for expenditure and/or capping of the GSF is approved by parliament, it literary means the people of Ghana have agreed and thus, no ministerial discretion whatsoever is exercised in the process.

Though the ministry has consistently maintained its position on the issue, academics and CSOs among others do not take the explanations provided by the ministry lightly and are strongly advocating for amendment to some key clauses in the Act paramount of which is the choice of priority areas as they are 'ambiguously defined' according to critics of the Act.

Ghana National Petroleum Corporation (GNPC)

The GNPC, together with other state agencies performs specialised and interdependent functions under the PRMA to manage petroleum revenues. From the study, between the 10 years under study, about US$2billion has been allocated to GNPC to enable the corporation meet its diverse obligations. The study also revealed that the Corporation has the best technical and manpower expertise to carry out its mandate as a NOC and even position itself as an operator going forward.

Regardless of such a high scoring point, over the years, political interferences have been cited as one of the foremost factors hampering the smooth operations of the Corporation. Nonetheless, GNPC's posturing as a potential operator further enhances the growth of Ghana's petroleum sector as it seeks to stimulate government revenues. Such an optimistic view of the petroleum sector in the medium to long term could probably be materialised

should the NOC's capacity be built to the status of a stand-alone operator while reducing political interferences to the barest minimum.

Public Interest and Accountability Committee (PIAC)

As an independent statutory body tasked with the mandate to monitor and ensure compliance in terms of transparency and accountability of petroleum revenues in Ghana, PIAC has since coming into force in September 2011 published 20 petroleum reports as of the end of 2020. These reports constitute 10 semi-annual and 10 annual reports. The study found that the committee's reports to a large extent promote transparency in the collection and utilisation of petroleum revenues. The publication of statutory reports on petroleum revenues, roundtable discussions as well as dialogue with stakeholders characterises PIAC's strategic approach to exercising its mandate. However, the accountability aspect seems to be dragging the successes chalked by the Committee over the years.

PIAC, though may have the power to independently assess how and when petroleum revenues were allocated and spent, cannot directly hold anyone responsible for the misappropriation of petroleum revenues. Indirectly, the committee pushes for accountability by making a recommendation in its report to parliament for necessary actions to be taken. The committee has been responsive and frequent with its reports which has been a reference point for petroleum revenue data over the years.

Other Key Findings

This section outlines other key findings from the study as follows.

a. The study revealed that there have been proposals for hedging in the petroleum sector. However, these proposals are yet to be implemented. The

GSF is therefore meant to serve as a hedge against revenue fluctuations.

b. The study also finds that petroleum revenue allocation is centralised in Ghana. As a result, local communities only benefit from direct government allocations to the local level such as ABFA funded projects and companys' corporate social responsibilities. Unlike in the mineral industry, petroleum revenues are not directly allocated to the MMDAs. Though the activities of petroleum production directly impact these communities and the cost, as a result, is mostly borne by the respective assemblies.

c. The energy transition is gradually becoming topical in many petroleum discussions in recent times. The study finds that stakeholders are mindful of the arguments against fossil fuels and the future of the petroleum industry for that matter. As an investment for fossil fuel-related projects are being cut in the quest to pave way for renewable energies, revenues from petroleum-related activities risk corresponding declines.

Conclusions

The story of Ghana with respect to hydrocarbon exploration which goes as far back as 1896 had its ups and downs. Ghana's oil and gas sector may be considered budding commercially, however, the sector has contributed to national development in diverse ways including infrastructure development, education, foreign exchange and others.

From 2011 to 2020, the government of Ghana received about $6.55billion in the form of petroleum revenues. The collection and management of such cash flows necessitate a robust framework and the Petroleum Revenue Management Act 2011 (Act 815) as amended (Act 893) provides the framework and the legal basis on which Ghana will harness and consolidate the gains made

in petroleum exploration and production. The implementation of the PRMA has ensured that key state institutions collectively function to manage and sustain the petroleum revenues due the state.

A decade of petroleum revenue management in Ghana has not been without challenges. Regardless of the challenges of the PRMA, as identified in the study, the Act has provided the template for the collection, allocation and distribution of petroleum revenues over the past 10 years in an organised and responsible manner.

The role of institutions is vital to the success of a resource-rich country. The mere discovery of a resource in a country does not automatically give rise to the so-called resource curse and the associated Dutch disease phenomenon. Evidence from literature (Larsen, 2006; Shaxson, 2007; Tamatey et al. 2017; and Acquah-Andoh et al. 2018) highlights the importance of institutions in turning the economic fortunes around following a discovery of natural resources.

There are calls for amendment of some sections of PRMA paramount of which is the justification for the selection of the priority areas, ministerial discretion on capping the stabilisation fund among others. Nonetheless, the implementation of the PRMA has to a large extent given Ghana the leverage in petroleum revenue management.

Thus, it is time to consider the recommendations from academia and other critiques of the PRMA to help reform the Act to make it more robust and ensure the sustainability of petroleum revenues in the long run.

Recommendations

The following provides suggestions on how to strengthen the PRMA going forward based on the findings from the study.

a. The priority areas should be clearly defined by law to do away with ambiguities and political discretions associated with them. The study recommends the establishment of a committee comprising project analysts, economists, financial advisors among other key technical professionals to scrutinise proposed ABFA projects before they are embarked on. This is necessary because it will help provide the justification for considering one priority area over the other based on economic analyses.
b. Institutional coordination between key agencies related to petroleum revenue management should be enhanced to further encourage transparency and smooth operations. This will also promote uniformity in the petroleum reports published by these agencies.
c. Thirdly, MMDAs should be allocated some percentage of petroleum revenues as with the case of the mining revenues. This will not only be a compensation for Project Affected Communities (PAC) but also be a catalyst for a balanced impact of petroleum revenues while promoting decentralisation in general.
d. PIAC's report and recommendations for that matter should be implemented and actions are taken where necessary to ensure that the statutory body lives to its mandate of ensuring transparency and accountability in the management of petroleum revenues in Ghana.
e. There should be a limit (minimum balance) on the Ghana Stabilisation Fund below which withdrawals cannot be made.

f. Finally, alternative energy sources particularly renewable energies are being promoted and acceptance of such on a large scale will significantly impact the petroleum sector and consequently petroleum revenues. It is therefore recommended that government agencies and policymakers rethink the future of the oil industry in relation to energy transition and petroleum revenues.

Suggestions for Further Research

Further researches are encouraged to drift towards how to optimise petroleum revenues in Ghana. Secondly, the potential impact of energy transitioning on the oil and gas sector and the Ghanaian economy as a whole is a viable research area. Lastly, factors influencing petroleum revenue collection and allocation in Ghana should be researched in greater details.

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APPENDICES

APPENDIX A: RESEARCH INSTRUMENT
IN-DEPTH STAKEHOLDER INTERVIEW GUIDE ON PETROLEUM

REVENUE MANAGEMENT ACT OF GHANA

This interview is part of a research that seeks to find out the extent to which Ghana's Petroleum Revenue Management Act 815 (2011) (PRMA) has performed since it was implemented about a decade ago. I am Godfred Kwaku Ennin, a 2nd Year Master of Philosophy Oil and Gas Resource Management Student at the Institute for Oil and Gas Studies, University of Cape Coast and a Ghana National Petroleum Corporation (GNPC)-UCC Professorial Chair Scholar. With funding from the GNPC, I am conducting this research in partial fulfilment for the award of MPhil Oil and Gas Resource Management. Based on your vast knowledge and experience about the subject matter, I would like to seek for your participation as a resourceful participant who could provide significant information to enrich this study. Please be assured that your responses to any of the questions posed will be used **strictly** for this research purpose. You are also assured of anonymity and confidentiality of your participation in this study.
Your candid contribution to this study is highly appreciated. Kindly proceed to answer the following questions as applicable.

SECTION A:

1. **General perception on the performance of the PRMA in Ghana**

The section seeks to gather information on the general perceptions about the PRMA since it was implemented. As a result, answers are solicited from key stakeholders in the industry with adequate knowledge and experience in the oil and gas sector. Please indicate the level of your perception, by ticking the right responses (√) as **Strongly Agree** (1), **Agree** (2), **Neutral** (3), **Disagree** (4) and **Strongly Disagree** (5) in the table below.

QUESTIONS	RESPONSES				
	1	2	3	4	5
Ghana's PRMA has performed according to my expectation since its passage in 2011.					
Ghana's fiscal system encourages upstream participation while increasing the profitability margins of the players.					
The PRMA has ensured adequate transparency and accountability in the management of petroleum revenues in Ghana.					
The current petroleum management framework of Ghana favours International Oil Companies (IOCs) than the Host Government (HG).					

The current petroleum management framework of Ghana favours the Host Government (HG) than the International Oil Companies (IOCs).					
GNPC's capacity should be built in order for it to be competitive in upstream business to increase its stakes to optimise revenue generation.					
The PRMA must be amended as soon as possible to meet changing circumstances facing the industry.					

SECTION B

A. Questions for GNPC

1. As an NOC, to what extent does fiscal system favours revenue optimisation in Ghana?
2. Royalty payment is second to Carried and Participating Interest (CAPI) as the largest source of petroleum revenue in Ghana. What are some of the plans and strategies in place to increase the revenue inflows from royalties and or corporate income taxes?
3. What are the mechanisms in place to ensure that Ghana generates more revenues from the petroleum sector?
4. How does Ghana secure its petroleum revenues against unexpected crude oil price fall and how far with considerations for hedging in the future if not interim?

B. Questions for Bank of Ghana (BoG)

1. How does BoG ensure that IOCs make payments to the Petroleum Holding Fund (PHF) on time and also what are the sanctions in the event that they default?
2. In what currency is payment made to the PHF?
3. How is transparency and accountability ensured at the time of deposit into and withdrawals from the PHF?
4. Revenue collection and allocation in Ghana is guided by the PRMA 815 (2011). What is the role of the BoG in ensuring that the stipulations made by the Act is adhered to in terms of how much is deposited and/or withdrawn from an account?

C. Questions for the Ministry of Finance

1. How does the Ministry ensure accountability and transparency in the deposit and withdrawals into the Annual Budget Funding Amount (ABFA)?
2. What are the considerations made before the four (4) priority areas are selected every year for subsequent revenue allocations?
3. How is the stabilisation fund capped and under what circumstances is it increased or reduced?
4. How does Ghana secure its petroleum revenues against unexpected crude oil price fall and how far with considerations for hedging in the future if not interim?
5. What is the role of the ministry in monitoring and evaluating the utilisation of petroleum revenues disbursed for investment in priority areas and infrastructure development?

D. Questions for the Public Interest and Accountability Committee (PIAC)

1. What is PIACs role in petroleum revenue management in Ghana?
2. To what extent does PIAC ensure transparency and accountability in Ghana's petroleum revenue management?
3. As part of PIAC's mandate, how is effective compliance with the Act by government and relevant institutions in the management and use of petroleum revenues and investments ensured?
4. To what extend does PIAC have the capacity to enforce the requirements of the Act?
5. How does PIAC seeks to increase government's stake in petroleum revenues?
6. How does PIAC ensures that revenues collected are adequate and efficiently utilised?
7. What are the challenges confronting PIAC in the performance of its mandates?

E. Question to the District Assemblies

1. How has petroleum revenues been utilised to develop communities within the district?

2. How much (preferably in percentage terms) of petroleum revenues is allocated to the district annually?
3. How often are revenues from petroleum allocated to the district?
4. How is transparency and accountability ensured in the allocation and utilisation of petroleum revenues at the District?
5. What are the factors militating against the efficient utilisation of petroleum revenues in the District?

F. Questions for independent Civil Society Organisations (CSOs) and individuals from Academia/Industry

1. To what extent has the PRMA achieved its objectives in terms of performance?
2. As an emerging petroleum producer, how does Ghana's fiscal framework enhance government access to petroleum revenue?
3. How can GNPC be made competitive in upstream operations so as to optimise Government's petroleum revenue?
4. To what extent can Ghana reduce its reliance on Carried and Participating Interest as a source of Government revenue while strategising to increase revenue from other sources such as Royalties, Corporate Income Tax and among others?
5. What are the challenges confronting the efficacy of the PRMA in Ghana?
6. In what ways could the challenges be resolved?

APPENDIX B: QUARTERLY GHANA PETROLEUM DATA FROM 2011 – 2020

QUARTER	VCOL (Million Barrels)	PCO (US$)	PR (Million US$)
2011Q1	0.995	112.80	112.27
2011Q2	0.995	116.28	115.66
2011Q3	0.991	110.67	109.65
2011Q4	0.949	112.55	106.86
2012Q1	0.996	111.63	111.16
2012Q2	1.993	108.10	215.46
2012Q3	0.947	112.56	106.59
2012Q4	0.995	108.44	107.86
2013Q1	1.992	110.90	220.87
2013Q2	1.991	101.39	201.89
2013Q3	0.995	111.66	111.09
2013Q4	1.816	108.20	94.72
2014Q1	1.894	109.97	205.00
2014Q2	0.948	108.42	205.44
2014Q3	1.983	105.77	104.44
2014Q4	2.856	81.12	177.11
2015Q1	1.974	44.16	160.27
2015Q2	1.860	58.91	113.82
2015Q3	0.948	60.80	55.41
2015Q4	0.948	47.09	44.79
2016Q1	1.896	41.68	66.23
2016Q2	0.995	48.41	48.17
2016Q3	0.984	47.25	46.49
2016Q4	0.951	49.40	46.90
2017Q1	1.981	52.35	103.67
2017Q2	2.893	49.23	146.14
2017Q3	1.949	45.95	89.51
2017Q4	2.939	54.28	161.98
2018Q1	2.964	63.31	187.63
2018Q2	1.991	75.17	149.69
2018Q3	2.886	74.14	216.02
2018Q4	1.942	69.19	134.89
2019Q1	2.937	59.03	178.05
2019Q2	3.981	66.73	262.52
2019Q3	1.989	62.44	123.77
2019Q4	2.890	61.10	178.43
2020Q1	3.843	58.93	223.05
2020Q2	0.993	12.24	12.23
2020Q3	3.889	36.69	147.94
2020Q4	2.890	39.08	113.07

APPENDIX C: ANNUAL SOURCES OF PETROLEUM REVENUE (MILLION US$)

Year	Royalties	CAPI	CITA	Surface Rentals	Other incomes
2011	122.172	321.953	-	-	-
2012	150.747	390.429	-	0.448	-
2013	175.409	453.574	216.985	0.798	-
2014	192.813	499.330	284.546	1.776	0.421
2015	104.209	270.084	20.411	0.466	1.004
2016	57.851	149.936	29.547	0.465	9.376
2017	135.860	365.441	36.958	1.570	0.584
2018	265.606	548.335	160.607	0.939	1.638
2019	236.794	505.988	191.137	1.110	2.553
2020	195.360	300.927	141.144	0.698	0.515

APPENDIX D: ANNUAL ALLOCATION OF PETROLEUM REVENUE (MILLION US$)

YEAR	GNPC	ABFA	GPF	GSF	GHF
2011	207.96	166.96	69.21	54.81	14.40
2012	230.95	286.55	24.12	16.88	7.24
2013	222.42	273.20	351.05	245.73	105.31
2014	180.71	409.07	388.23	271.76	116.47
2015	126.86	239.30	21.67	15.17	6.50
2016	88.50	98.38	42.16	29.51	12.65
2017	182.04	169.46	203.83	142.68	61.15
2018	305.27	235.10	436.75	305.72	131.02
2019	260.56	395.47	269.01	188.30	80.70
2020	198.65	273.38	166.61	116.63	49.98

APPENDIX E: CAMERON & TRIVEDI'S DECOMPOSITION OF IM-TEST

Source	chi2	df	p
Heteroskedasticity	3.29	5	0.6560
Skewness	3.08	2	0.2149
Kurtosis	9.22	1	0.0024
Total	15.58	8	0.0488

APPENDIX F: DIAGNOSTIC TEST FOR COLLINEARITY

Variable	VIF	1/VIF
lnPCO	1.04	0.958130
lnVCOL	1.04	0.958130
Mean VIF	1.04	

APPENDIX G: COMPOSITION OF STAKEHOLDERS FOR THE STUDY

Institution/Agency/Individuals	Number of Participants
A. Government Agencies	**6 (Six)**
1. Ghana National Petroleum Corporation (GNPC)	1
2. Bank of Ghana	1
3. Ministry of Finance	1
4. Ministry of Energy	1
5. Public Interest and Accountability Committee (PIAC)	1
6. Petroleum Commission	1
B. Civil Society Organizations (CSOs)	**3(Three)**
1. Natural Resource Governance Institute (NRGI)	1
2. African Centre for Energy Policy (ACEP)	1
3. Gesellschaft für Internationale Zusammenarbeit (GIZ)	1
C. Oil Producing MMDAs* in Ghana	**3 (Three)**
1. Ahanta West Municipal Assembly	1
2. Ellembelle District	1
3. Jomoro Municipal Assembly	1
D. Stakeholders from Academia/Industry	**4 (Four)**
Total number of stakeholders for the study: 16	
***Metropolitan, Municipal and District Assemblies**	

APPENDIX H: INTRODUCTORY LETTER

UNIVERSITY OF CAPE COAST
COLLEGE OF HUMANITIES AND LEGAL STUDIES
FACULTY OF SOCIAL SCIENCES
INSTITUTE FOR OIL AND GAS STUDIES

Telephone: +233 206608458
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UNIVERSITY POST OFFICE
CAPE COAST, GHANA

Our Ref: IOG/M4/96
Your Ref:

6th August, 2021

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

INTRODUCTORY LETTER: MR. GODFRED KWAKU ENNIN

The bearer of this letter, Mr. Godfred Kwaku Ennin with registration number *SS/ORM/19/0003*, contact number *0543960870* and email address: ***godfred.ennin@stu.ucc.edu.gh***, is an M.Phil. Oil and Gas Resource Management student of the Institute for Oil and Gas Studies, Faculty of Social Sciences, College of Humanities and Legal Studies, University of Cape Coast. He is conducting a research on the topic: **"Performance Review of Petroleum Revenue Management in Ghana from 2011-2020"**.

As part of this research, he is required to collect data from key stakeholders in the oil and gas industry. The Institute would be very grateful if you could provide any assistance to enable him complete his research work.

Thank you.

Yours faithfully,

DIRECTOR
INSTITUTE FOR OIL & GAS STUDIES
UNIVERSITY OF CAPE COAST
CAPE COAST

Dr. Edward K. Nunoo
For: Director

APPENDIX I: ETHICAL CLEARANCE

UNIVERSITY OF CAPE COAST

INSTITUTIONAL REVIEW BOARD SECRETARIAT

TEL: 0558093143 / 0508878309
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9TH NOVEMBER 2021

Mr. Godfred Kwaku Ennin
Institute for Oil and Gas Studies
University of Cape Coast

Dear Mr. Ennin,

ETHICAL CLEARANCE – ID (UCCIRB/CHLS/2021/54)

The University of Cape Coast Institutional Review Board (UCCIRB) has granted Provisional Approval for the implementation of your research titled **Performance Review of Petroleum Revenue Management in Ghana from 2011-2020.** This approval is valid from 9th November 2021 to 8th November, 2022. You may apply for a renewal subject to submission of all the required documents that will be prescribed by the UCCIRB.

Please note that any modification to the project must be submitted to the UCCIRB for review and approval before its implementation. You are required to submit periodic review of the protocol to the Board and a final full review to the UCCIRB on completion of the research. The UCCIRB may observe or cause to be observed procedures and records of the research during and after implementation.

You are also required to report all serious adverse events related to this study to the UCCIRB within seven days verbally and fourteen days in writing.

Always quote the protocol identification number in all future correspondence with us in relation to this protocol.

Yours faithfully,

Samuel Asiedu Owusu, PhD
UCCIRB Administrator

ADMINISTRATOR
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