

# Crude Oil Production, Corruption and Upstream Oil Revenue in Nigeria: General Outlook, Conditions and Methodology

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## **Abstract**

*The study examined general outlook and conditions of crude oil production, corruption risk and upstream oil revenue in Nigeria. The study focused mainly on the revenue generated from crude oil production and oil export with the purpose of assessing oil exploration and corruption with the objective of investigating Nigeria's oil export and its contribution to the growth of revenue generation and finding out if the level of corruption affects the upstream revenue generation in Nigeria. It is discovered that the following variables are germane in the empirical studies reviewed and econometric models are conceptualized that proven oil reserve, OPEC quotas, global oil demand, global oil supply, geopolitical risk index, disaster risk index, global terrorism index, global oil price, exchange rate variation, upstream oil theft, number of pipeline vandalism, oil bunkering, tax evasion and corruption perceptions index are relevant and possible determinants of downstream oil revenue in Nigeria. An empirical study to investigate the relationship and causal effect of the above-mentioned factors are recommended for further study with a view to making reliable policy statements on revenue sustainability and highlighting and reducing the counterproductive effects of corruption risks in the exploration and production of crude oil in Nigeria.*

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**Keyword:** Crude Oil Production, Corruption and Upstream Oil Revenue  
**JEL Classification code:** H0, E66, H27

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## **1.0 Introduction**

Oil was discovered in Nigeria in 1956 at Oloibiri in the Niger Delta after half a century of exploration. The discovery was made by Shell-BP, at the time the sole concessionaire. Nigeria joined the ranks of oil producers in 1958 when its first oil field came on stream producing 5,100 bpd. Nigeria joined the Organization of Petroleum Exporting Countries (OPEC) in 1971 and

established the Nigerian National Petroleum Company (NNPC) in 1977; a state owned and controlled company which is a major player in both the upstream and downstream sectors.

The Nigerian economy is heavily dependent on the oil sector which, according to the International Monetary Fund (IMF), accounts for over 95 percent of export earnings and about 40 percent of government revenues. Nigeria has been an OPEC member since 1971. The country has the second largest oil reserves in Africa and is the continent's primary oil producer. The light, sweet quality of Nigerian crude makes it a preferred gasoline feedstock.

Nigeria is the 10th largest hydrocarbon reserve and is the 12th producer of oil & gas in the world, contributing approximately 3% to global production. It also holds an estimated 36.5 billion barrels of crude oil & condensates and 180.4 trillion standard cubic feet of gas reserves mostly domiciled in the Niger–Delta (Ngwu, 2014). In view of this, oil has been regarded as the ‘mainstay’ of the Nigerian economy with an alarming dependence on it which has invariably turned the economy of the country to a mono product economy. The need for, demand for, and wealth from oil has placed Nigeria in a cynosure amongst comity of nations, after all, oil is a major foreign exchange earner and a major contributor to federal reserves. Oil revenue was seen as a blessing to Nigeria economy because it contributed massively to income generated in the country, but then it was also seen as a curse as it gave rise to the neglect of the other sectors (Agbaeze & Ukoha, 2018).

Even with the high price per barrel of the product on the worldwide market and the invading criminal stealing an estimated 80% of what is produced, the oil sector’s reputation as a trustworthy source of foreign cash is under threat. Nigeria continues to struggle as a result of low output in crude oil production brought on by crude oil theft, which also results in low foreign exchange earnings. According the most recent Monthly Oil Market Report, November, 2022, Nigeria was only able to produce 1.158 million barrels per day (bpd) of the 1.772 million bpd of crude oil that OPEC had allotted to the nation in June, 2022. This is lower than the daily average production of 1.20 million barrels per day (9mbpd) recorded in 2021. Unfortunately, Nigeria is losing out due to an increase in oil theft and pipeline vandalism while other producers, such as Saudi Arabia and the United Arab Emirates are benefitting from the ongoing conflicts between Russia and Ukraine and the resulting rise in the price of crude oil.

### **1.1 Upstream Oil Revenue**

The petroleum industry is the most strategic industry all over the world. The role of oil and gas in the Nigerian economy cannot be over emphasized. Payments are made by oil and gas companies to the government for the extraction of natural resources.

The Upstream Sector is divided into two (2) main segments

- a) Exploration and Field Development
- b) Production, Sales and Export of Crude Oil

According to Nigerian Upstream Petroleum Regulatory Commission Upstream Oil revenue accounts are specifically tabulated below. Also Nigeria Extractive Industries Transparency (NEITI) 2020 report upstream oil revenue accruable to federal government denominated in Dollar accounts with CBN comprises of petroleum profit tax, royalty (oil), royalty (gas), concession rentals, flare gas payments, signature bonus and licence renewals.

**Table 1: Upstream oil revenues**

S/No	Upstream Oil Revenue	Designated Account
1	Crude oil and natural gas export sales(US\$)	Central Bank of Nigeria (CBN) Oil Revenue Account. Accountant General of the Federation FGN
1	(a) Royalty on Oil (US\$) (b) Royalty on Condensates (US\$) (c) Royalty on Modify Carry Agreement MCA (US\$)	Central Bank of Nigeria (CBN) Oil Revenue Account. Accountant General of the Federation FGN
2	(a) Royalty on Gas Sales (US\$) (b) Royalty on Natural Gas Liquids Sales (US\$)	Central Bank of Nigeria (CBN) Oil Revenue Account. Accountant General of the Federation FGN
3	(a) Royalty on Production Sharing Contract(PSCs) (US\$) (b) Royalty of Joint Ventures (JVCs) (US\$) (c) Royalty on Sole Risks(SRs) (US\$) (d) Royalty of Service Contracts (SCs) (US\$) (e) Royalty of Marginal Fields(MFs) (US\$)	Central Bank of Nigeria (CBN) Oil Revenue Account. Accountant General of the Federation FGN
4	Petroleum Profit Tax (₦)	Central Bank of Nigeria (CBN) Oil Revenue Account. Accountant General of the Federation FGN
5	Concession Rentals(US\$)	Central Bank of Nigeria (CBN) Oil Revenue Account. Accountant General of the Federation FGN
6	Licence Renewals(US\$) (a) Oil Prospecting Licence (OPL) (b) Oil Mining Licence (OML)	Central Bank of Nigeria (CBN) Oil Revenue Account. Accountant General of the Federation FGN
7	Signature Bonus and Flare Gas Payments(US\$)	Central Bank of Nigeria (CBN) Oil Revenue Account. Accountant General of the Federation FGN

Source: Nigerian Upstream Petroleum Regulatory Commission (NUPRC), 2022.

The upstream oil and gas sector is dominated by international oil companies (IOCs). Shell, Chevron, Mobil, Agip, Addax and Total, currently dominate the oil industry accounting for over 80% of the country's crude oil production. Activities in the sector are carried out under various arrangements including Joint Ventures (JVs) and Production Sharing Contracts (PSCs) with the Nigerian National Petroleum Corporation (NNPC). Other contractual arrangements include sole risk contracts and risk service contracts. The IOCs also hold more than 90% of the oil reserves and operating assets. Production by IOCs has shrunk over the past ten years by an annual

average of 4%, while marginal field players have increased production by up to 15% annual growth rate.

The upstream oil revenue streams disaggregated by oil projects are: Concession Rental and licenses; Royalty (Oil); Royalty (Gas); Signature Bonus and Flared Gas Payments

Government of the Federation owns all natural resources upon and within the Nigerian territory. Through the Federal Ministry of Petroleum Resources, it oversees the activities in the petroleum industry in the country. The ministry is headed by a minister who is appointed by the president subject to approval by the National Assembly. The Petroleum Act provides for discretionary award of licences and leases by the Minister, to operators in the industry, to win, work and dispose of crude oil, gas, condensates. The position of Minister of Petroleum resources was held by the President in 2020. The Ministry was responsible for setting policy for the sector, while other departments and agencies carried out different roles in the industry. Some of these departments and agencies are; The Department of Petroleum Resources (now becoming the Nigerian Upstream Petroleum Regulatory Commission (NUPRC) and The Nigerian Midstream and Downstream Regulatory Authority with robust provisions for gas and liquids operations; The Nigerian National Petroleum Corporation; The Federal Inland Revenue Service; The Nigerian Content Development Monitoring Board; Niger Delta Development Commission and Petroleum Products Pricing Regulatory Agency.

The Revenue Mobilisation Allocation and Fiscal Commission (RMAFC) is the agency of Government statutorily empowered to monitor all revenue (including non-oil) accruable to the federation and the disbursement of such revenue. The incorporation of a limited liability company known as Nigerian National Petroleum Company Limited (NNPC Limited) to which the determined assets, interests and liabilities of NNPC and its subsidiaries will be transferred. The introduction of the Hydrocarbon tax and the application of the Company Income Tax (CIT) to all companies operating in the oil and gas industry as these taxes will replace the Petroleum Profit Tax (PPT): Changes in the computation of royalties; Establishment of the Host Communities Development Trust for execution of projects for the benefit and sustainable development; economic empowerment opportunities, infrastructural development, health care development, etc., for the host communities; mandatory disclosure of contracts and Licenses.

The Nigerian Government (The Federation), participates in the exploration, production, refining and marketing of oil and gas through the NNPC and its subsidiaries. The oil and gas industry was guided by quite a number of legislations in 2020; these include but not limited to; Petroleum Act Cap P10 LFN 2004 (the Petroleum Act); Nigerian National Petroleum Corporation Act Cap N123 LFN 2004 (the NNPC Act); Associated Gas Reinjection Act 2004 and the Associated Gas Re-injection (Amendment Act) 2004 (the Associated Gas Acts); Petroleum Profits Tax Act Cap P13 LFN 2004 (the PPTA); Nigerian Oil and Gas Industry Content Development Act 2010; Niger-Delta Development Commission (Establishment Act) Amendment 2017; The National Oil Spill Detection and Response Agency (NOSDRA) Act 2006; Deep Offshore and Inland Basin PSC (Amendment) Act, 2019; The Nigerian Oil and Gas Industry Contents Development Act 2010; Companies Income Tax Act LFN 2004; Education Tax Act LFN 2004; Value Added Tax (VAT) LFN 2004; Petroleum (Drilling and Production) (Amendment) Regulation 2020

## **1.2 Crude oil production**

Nigeria's proven reserves has hovered around 37 billion bbl in the past 10 years. More recently, the reserves have declined from 37.5 billion bbl in 2017 to 36.9 billion bbl in 2020.

**Table 2: Nigeria's proven oil reserve**

<b>YEAR</b>	<b>BILLION BARRELS PER DAY</b>
<b>2010</b>	<b>37.2</b>
<b>2011</b>	<b>36.2</b>
<b>2012</b>	<b>37.1</b>
<b>2013</b>	<b>37.1</b>
<b>2014</b>	<b>37.4</b>
<b>2015</b>	<b>37.1</b>
<b>2016</b>	<b>37.5</b>
<b>2017</b>	<b>37.5</b>
<b>2018</b>	<b>37.0</b>
<b>2019</b>	<b>36.9</b>
<b>2020</b>	<b>36.9</b>

Source: BP Statistical review 2021

In 2010, total oil production in Nigeria was slightly over 2.46 million bbl/d, making it the largest oil producer in Africa. Crude oil production averaged close to 2.15 million bbl/d for the year. Recent offshore oil developments combined with the restart of some shut-in onshore production have boosted crude production to an average of 2.17 million bbl/d for the month of July 2011. Planned upstream developments should increase Nigerian oil production in the medium term but the timing of these startups will depend heavily on the PIB and the fiscal/regulatory terms it imposes on the oil industry. Many of the planned projects described below have already been delayed.

**Table 3: Crude Oil Reserves and OPEC Share in Percentage**

<b>S/NO</b>	<b>COUNTRY</b>	<b>CRUDE OIL RESERVES IN BILLION BARRELS</b>	<b>OPEC SHARE IN PERCENTAGE</b>
1	Venezuela	303.47	24.40%
2	Saudi Arabia	267.19	21.50%
3	Iran	208.6	16.80%
4	Iraq	145.02	11.70%
5	UAE	111	8.90%
6	Kuwait	101.5	8.20%
7	Libya	48.36	3.90%
<b>8</b>	<b>Nigeria</b>	<b>37.05</b>	<b>3.00%</b>

9	Algeria	12.2	1.00%
10	Angola	2.52	0.20%
11	Gabon	2	0.20%
12	Congo	1.81	0.10%
13	Equatorial Guinea	1.1	0.10%

Source: OPEC Statistical Bulletin, 2022

As a member of the Organization of Petroleum Exporting Countries (OPEC), Nigeria has agreed to crude oil production limits that have varied over the years but are currently set at 1.673 million bbl/d. OPEC quotas do not appear to have an impact on production volumes or investment decisions to the same degree as unrest in the Niger Delta.

In 2010, Nigeria exported approximately 2.2 million bbl/d of total oil and 1.8 million bbl/d of crude oil. Nigeria is an important oil supplier to the United States. Over 40 percent of the country's oil production (980,000 bbl/d of crude oil, and slightly over 1 million bbl/d of total oil and products) is exported to the United States making Nigeria the 4th largest foreign oil supplier to the United States in 2010. The light, sweet quality crude is a preferred gasoline feedstock. Consequently, disruptions to Nigerian oil production impacts trading patterns and refinery operations in North America and often affect world oil market prices.

**Table 4: Total Fiscalised Crude Oil Production**

<b>Name of crude oil production arrangement</b>	<b>mbbls</b>
Joint Venture (JV)	271,418.16
Production Sharing Contract (PSC)	253,781.76
Service Contract (SC)	1,099.73
Sole Risk (SR)	99,839.56
Marginal Field (MF)	20,648.23
<b>Total Production</b>	<b>646,787.44</b>

Source: Nigerian Upstream Petroleum Regulatory Commission (NUPRC), 2022.

Available information indicates that additional importers of Nigerian crude oil include Europe (20 percent), Asia (17 percent), Brazil (8 percent), and South Africa (4 percent). Despite shut-in production, Nigerian trade patterns appear to have remained stable over the past several years, most of which can be attributed to capacity additions combined with slightly decreasing domestic consumption and shifting world demand.



Lifting is the process of taking crude oil out of quantities produced for the purpose of export or domestic utilisation. Lifting occurs at the various crude oil terminals and it is done by companies and by the NNPC, for the Federation. Lifting by the NNPC is categorised into federation volumes for export, federation volumes for domestic utilisation and NPDC volumes.

Sales of Federation Crude Oil and Gas: Proceeds from the sales of Federation equity crude oil; Proceeds from the sales of domestic crude oil; Proceeds from the sales of profit oil; Proceeds from the sales of Federation equity gas; Proceeds from the sales of Feedstock

The 23 revenue streams that are covered in this report are classified under 4 categories;

A. Revenue from the Federation share of production entitlements: Proceeds from the sale of federation export crude oil; Proceeds from the sale of profit oil; Proceeds from the sale of domestic crude; Proceeds from the sale of federation gas and Proceeds from the sale of feedstock

B. Revenue streams that are specific to oil and gas companies as taxes, levies and other Payments on licenses or use: Petroleum profit tax (PPT); Royalty (oil); Royalty (gas); Signature bonus; Flared gas payments; Concession rentals; Transportation fees and Miscellaneous income

C. Revenue from oil and gas companies as other forms of taxes, levies and returns on investment: Company Income Tax (CIT); Value Added Tax (VAT); Dividend from NLNG; Pay as you earn (PAYE); Capital Gain Tax (CGT); Withholding Tax (WHT) and Education Tax (EDT)

Revenue from oil and gas companies paid to Sub-National entities: Niger Delta Development Commission (NDDC) levy; Nigerian Content Development & Monitoring Board (NCDMB) levy and NESS Levy

The Federation of Nigeria is entitled to Oil and Gas revenue from its participation in various production arrangements in the Upstream Sector of the petroleum industry. These arrangements have been explained here. Crude oil and gas are normally allocated to the Federation from Joint Venture operations through the NNPC in accordance with the Federation's equity share or participatory interests in each of the Joint Venture operations. The Federation is also entitled to crude oil and gas from In-Kind payments for Royalty and Petroleum Profits Tax (PPT) as well as Profit Oil from Production Sharing Contract (PSC) operations in the country. Furthermore, Oil and Gas Revenue is derived by the Federation from residual crude oil and gas production from JV fields under certain Alternative Funding arrangements such as Third-Party Financing arrangements and Modified Carry Agreement (MCAs).

The NNPC-COMD is saddled with the responsibilities of lifting, marketing and sale of all Government crude oil and gas entitlements on behalf of the Federation from the various production arrangements and also on behalf of the NPDC. The proceeds from the sale of all liftings (except those meant for NPDC accounts) are deposited into transitional bank accounts (JP Morgan Chase, JV Proceeds Account, CBN Domestic Sales Naira Account, FIRS and DPR designated bank accounts). These are subsequently transferred to JV Cash-Call, other third parties (escrow) account and the Federation Account.

The Third-Party finance lifting are Crude Oil and Gas lifting from fields that are financed using alternative finance/loan facility which require the servicing of debt obligations before remitting

the balance into the Federation Account as Price Balance. Thus, the Federation equity crude oil and gas are accounted for directly by the NNPC while inter-agencies reconciliation are carried out with DPR and FIRS to ensure that proceeds of Royalty oil and PPT/CIT/EDT oil lifted on behalf of DPR and FIRS respectively are confirmed to the respective designated banks accounts. Other lifting on behalf of NPDC are deposited into the designated NPDC accounts.

The buyers of the crude oil and gas, who are selected through a competitive bidding process, are normally directed to make payments for the invoice values of their lifting of crude oil and / or gas – as the case may be – into the respective accounts, and the affected parties are informed by SWIFT messages when the transaction is completed. The Central Bank of Nigeria remains the custodian of all the funds in the Foreign and local Bank Accounts. The process of sales and remittances of proceeds into the respective accounts.

**Table 5: List of Upstream Companies (Exploration, Production and Export) in Nigeria**

S/No	Name of upstream oil companies in Nigeria
1	Nigeria Petroleum Development Company Ltd
2	Mobil Producing Nigeria Unlimited
3	Shell Nigeria Exploration and Production Company Limited
4	Star Deep Water Petroleum Limited
5	Shell Petroleum Development Company
6	Total Exploration and Production Nigeria Ltd
7	Chevron Nigeria Ltd
8	Total Upstream Nigeria Limited
9	Esso Exploration and Production Nigeria Ltd
10	Nigeria Agip Oil Company Ltd
11	AITEO Eastern Exploration and Production Ltd
12	Equinor Nigeria Energy Company Limited
13	Famfa Oil Ltd
14	Esso Exploration and Production (Offshore East) Nigeria Ltd 138,896
15	Addax Petroleum Development Limited
16	Amni International Petroleum Ltd
17	Sterling Oil Exploration and Energy Production Company Limited (SEEPCO)
18	Shoreline Natural Resources Ltd
19	Seplat Petroleum Development Company
20	Nigerian Agip Exploration Limited
21	ND Western Limited
22	Oriental Energy Resources Ltd
23	Neconde Energy Limited
24	Oando Oil Ltd
25	Eroton Exploration and Production Company Ltd
26	Elcrest Exploration and Production Limited
27	Addax Petroleum Exploration Nigeria Limited
28	Midwestern Oil & Gas Limited
29	Newcross Exploration and Production Limited



30	Moni Pulo Ltd
31	Sahara Field Production Limited
32	Prime 127 Limited (Petrobras Oil and Gas Ltd)
33	Panocean Oil Nigeria Limited
34	Continental Oil and Gas Limited
35	First Hydrocarbon Nigeria
36	Energia Limited
37	Yinka Folawiyo Petroleum Limited
38	Green Energy International Ltd
39	Platform Petroleum Ltd
40	Niger Delta Petroleum Resources Limited
41	Frontier Oil Ltd
42	Belema Oil Producing Limited
43	Enageed Resources Ltd
44	Pillar Oil Ltd
45	Conoil Producing Ltd
46	Agip Energy and Natural Resources Limited
47	Sterling Global Oil Resources Limited
48	First Exploration and Production Limited
49	Waltersmith Petroman Oil Ltd
50	Network Exploration & Production Ltd
51	Chorus Energy Limited
52	South Atlantic Petroleum Ltd
53	Brittania U Nigeria Ltd
54	Universal Energy Limited
55	China National Offshore Oil Corporation
56	All Grace Energy Limited
57	Brasoil Oil Services Company Nigeria Limited
58	Dubril Oil
59	Texaco Nigeria Outershelf Ltd
60	Excel Exploration and Production Limited
61	Lekoil Limited
62	Bilton Energy Limited
63	Orient Petroleum Resources Limited
64	Millenium Oil & Gas Limited
65	Suntrust Oil Company Nigeria Limited
66	Chevron Producing Nig Ltd
67	Sterling Exploration Limited
68	Nexen Petroleum Nigeria Limited
69	Summit Oil International Ltd

Source: Source: Nigerian Upstream Petroleum Regulatory Commission (NUPRC), 2022.

**Table 6 : Fiscalised Crude Oil Production by Terminal in Nigeria,**

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S/No Name of Oil Crude oil Terminals in Nigeria

- 1 Forcados SPDC Forcados
- 2 Bonny SPDC Bonny Light
- 3 QIT Mobil Qua Ibo
- 4 Egina TUPNI Egina
- 5 Escravos Chevron
- 6 Agbami Star Deep
- 7 Bonga SNEPCO
- 8 Akpo TUPNI
- 9 Brass NAOC Brass Blend
- 10 Odudu TEPNG Amenam
- 11 Erha Mobil
- 12 Usan Mobil
- 13 Tulja SEEPCO / SGORL
- 14 EA (Sea SPDC EA Energy)
- 15 Ugo Neconde Ugo Ocha
- 16 Yoho Mobil Yoho
- 17 Antan Addax Antan Blend
- 18 Abo NAE Abo
- 19 Okoro Amni Okoro
- 20 Okono NPDC Okono
- 21 Ebok Oriental Energy
- 22 Pennington Chevron Pennington Light
- 23 Otakikpo Green/Energy
- 24 Okwori Addax Okwori
- 25 Anyala/Madu
- 26 Aje Yinka/Folawiyo
- 27 Ubima All Grace Ubima
- 28 Ukpokiti Express/Sheba
- 29 Ima Amni Ima
- 30 Ajapa Britannia- U Ajapa

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Source: DPR 2020 signed-off Report

The National Petroleum Investment Management Services (NAPIMS), now Nigerian Upstream Investment Company) under the new Petroleum Investment Act (PIA), 2021, in the Exploration and Production (E & P) Directorate is the upstream arm of NNPC that oversees the federation investments in the Joint Venture Companies (JVCs), Production Sharing Companies (PSCs) and Service Contract Companies (SCC). NAPIMS is, therefore, set up to earn margin arising from investments in the JVCs, PSCs, SCC, with the multinationals and also protect the nation's strategic interest in the JVCs.

Foreign companies operating in joint ventures (JVs) or production sharing contracts (PSCs) with the Nigerian National Petroleum Corporation (NNPC) include ExxonMobil, Chevron, Total, Eni/Agip, Addax Petroleum (recently acquired by Sinopec of China), ConocoPhillips, Petrobras, StatoilHydro, and others.

### **1.3 Corruption**

From inception, oil production in Nigeria has been associated with a widening of the income gap as well as increasing poverty and corruption of state institutions. Weak control on petroleum governance made corruption possible. Rent-seeking in regulation and at political levels could continue for decades. According to international rankings, Nigeria's corruption level is perceived to be among the highest in the world. It constantly was ranked among the bottom three of Transparency International's Corruption Perception Index (CPI).

Nwankwo (2014) investigates the impact of corruption on the growth of Nigerian economy using granger causality and regression techniques. The study used gross domestic product (GDP) as a proxy of economic growth and corruption index as proxy of corruption in the analysis. The study revealed that the level of corruption in Nigeria over the year has significant negative impact on economic growth. The implication of this study is that economy cannot growth fast without zero tolerance in corruption.

Lawal and Victor (2012) investigated the crooking out effects of corruption in Nigeria using parsimonious error correction mechanism and employed experimental research design approach for the data analysis and revealed that there is a negative relationship corruption and output growth in Nigeria. The implication of this is that Nigeria government should introduce a national re-orientation program to educate people on the crucial need to eradicate corruption in all sectors of Nigeria economy and socio-political system.

In Nigeria, most of the oil firms are controlled by Multi-National Companies and Multi-National Companies award contracts to other oil servicing firms. When Multi-National Companies need supply of any material for oil production, they call for tender of which many oil servicing firms will declare their interest. In a real world of economy, the contract is expected to be awarded to those who will deliver a good and quality product for effective production, but unfortunately in countries like Nigeria the bidders tend to bribe the officials (like the procurement officers) so as to win the contract to themselves. This practice has a negative effect because if the servicing firm that won the contact cannot be able to provide quality products needed, it will affect the quality of oil production at that particular period which thereby affects the economy.

Nigeria as a net crude oil exporting country and a member of the OPEC bloc has setbacks that impede her from reaching her required oil production benchmark by OPEC. One of these setbacks is the hostile crude-oil explorative environment. Ikue et al. (2021) investigated the interaction between rig-counts and oil production on economic growth in Nigeria, using data from 1980-2019. Dwelling on the ARDL technique. It is concluded that the contribution of oil-revenue to economic growth in Nigeria is promising on the safety of the explorative environment. The study arrived at this conclusion because the results supported the arguments that the reduction of oil rigs due to social unrest contributed to the shortage of production output and underwrite the parts of output to oil revenue; also, that, domestic crude-oil activities have not

contributed meaningfully to the growth of the Nigerian economy, rather it has resulted in negative activities such as land and water pollution, social unrest and negative externality. Hence, the State have diverted the resources that was supposed for capital investment to fighting and appealing pipeline vandals and Oil Militia; and remedy to the negative externality.

#### Terrorism/Militancy/Instability

Nigeria's hydrocarbon resources are the mainstay of the country's economy but development of the oil and natural gas sectors is often constrained by instability in the Niger Delta. The oil industry is primarily located in the Niger Delta where it has been a source of conflict. Local groups seeking a share of the oil wealth often attack the oil infrastructure and staff, forcing companies to declare force majeure on oil shipments. At the same time, oil theft, commonly referred to as "bunkering", leads to pipeline damage that is often severe, causing loss of production, pollution, and forcing companies to shut-in production. The industry has been blamed for polluting air, soil and water leading to observed losses in arable land and decreasing fish stocks.

According to the Oil and Gas Journal, Nigeria had an estimated 37.2 billion barrels of proven oil reserves as of January 2011. The majority of reserves are found along the country's Niger River

Delta and offshore in the Bight of Benin, the Gulf of Guinea, and the Bight of Bonny. Current exploration activities are mostly focused in the deep and ultra-deep offshore with some activities in the Chad basin, located in the northeast of the country.

Since December 2005, Nigeria has experienced increased pipeline vandalism, kidnappings and militant takeovers of oil facilities in the Niger Delta. The Movement for the Emancipation of the

Niger Delta (MEND) is the main group attacking oil infrastructure for political objectives, claiming to seek a redistribution of oil wealth and greater local control of the sector. Additionally, kidnappings of oil workers for ransom are common and the Gulf of Guinea is also an area that has seen incidents of piracy. Security concerns have led some oil services firms to pull out of the country and oil workers unions to threaten strikes over security issues. The instability in the Niger Delta has caused significant amounts of shut-in production and several companies to declare force majeure on oil shipments. EIA estimates Nigeria's nameplate oil production capacity to have been close to 2.9 million barrels per day (bbl/d) at the end of 2010 but as a result of attacks on oil infrastructure, daily crude oil production ranged between 1.7 million and 2.1 million barrels. Disruptions have been attributed to direct attacks on oil infrastructure as well as pipeline leaks and explosions resulting from bunkering activities.

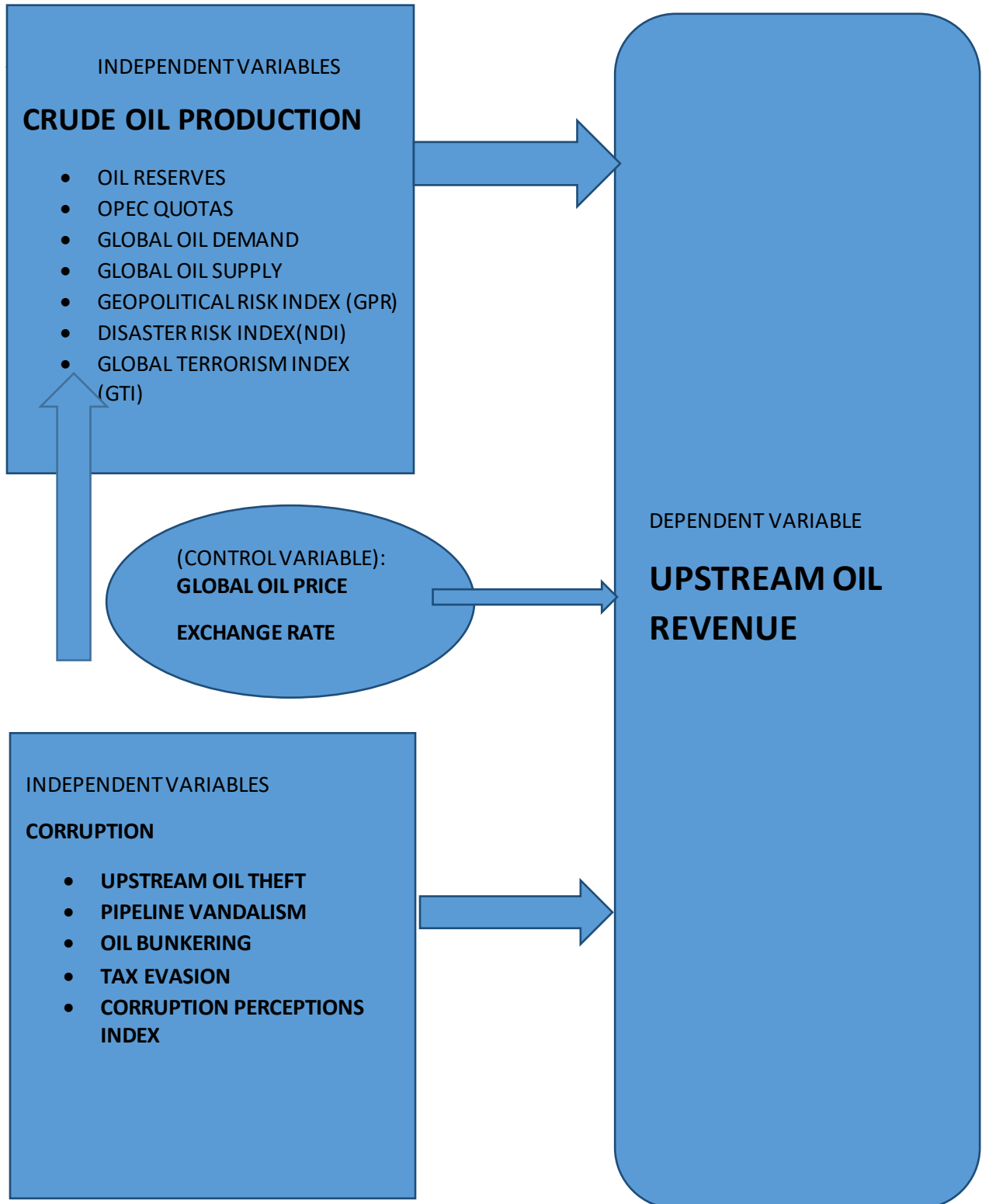
Towards the end of 2009 an amnesty was declared and the militants came to an agreement with the government whereby they handed over weapons in exchange for cash payments and training opportunities. This amnesty has led to decreased attacks and some companies have been able to repair damaged oil infrastructure. However, the lack of progress in job creation and economic development has led to increased bunkering and other criminal attacks, which can significantly damage oil infrastructure.

Nigeria's oil reserve

Nigeria's oil reserve

Stagnated at 37billion barrels but Kolmani crude oil asset could change that according to Nigeria Extrative Industries transparency Initiative (NEITI). NEITI said the Kolmani project could add to nigeria's crude oil reserves, stating that new crude oil discoveries in other parts of the country add to production figures and increase revenue for the country. The emergence of crude oil discoveries can be used to solve urgent national challenges because the country needs all the revenue it can get and Nigeria needs to also increase its self-sufficiency in terms of petroleum products.

## Conceptual framework





## Authors' conceptualization and design

### 2.0 The Resource Curse Theory

The resource curse theory was first used in the year 1998 by Auty, who tried to illustrate how rich countries blessed by natural endowment are unable to improve their economy even as this economy witnesses low pace of development compared to countries that are not blessed with natural resources. The resource curse theory also postulates that countries blessed with rich natural resource fail to develop the infrastructural projects and other sectors in their economy which eventually leads to financial problem. Little or no investment is redeployed back to the resource endowed country. Auty (1993) opined that countries with abundant natural resource are outrightly forced to depend on other nations for goods and services which they might eventually end up losing. The basic reason why countries that export their natural resource to foreign country lose is because revenue that is generated from exported product to other countries will eventually be used to purchase finished product at a high cost. According to Hardin (1968) he discovered that over exploitation of natural resource arises as a result of free access to natural resource thus, creating an avenue for socio-political crises and interstate crises which on the long run limits government from actively involving themselves in providing basic amenity.

Resource endowment theory of growth: The major advocates of this theory was Adam Smith "absolute cost advantage", David Ricardo "Comparative cost advantage" among others, they argues that countries should specialize to produce and export according to their comparative advantage. The theory of comparative advantage suggests a country gains the greatest

Economic benefit relative to other countries by producing at lower overall cost, commodities which a country has in abundance or can be easily produced. Other countries will therefore benefit from trade only if they accept the cost advantage of the trading country and focus on producing a commodity in which they have an advantage. It is this theory that guides resource endowment economist's belief in free trade, specialization and the international division of labour. This was their reasoning behind why some countries produce agricultural and mineral commodities while others produce industrial goods.

Asagunla and Agbede (2018) examined oil revenue and output growth in Nigerian using a time series data between 1981 and 2014. The study therefore employed an Ordinary Least Square (OLS) analysis to estimate this relationship. The unit root test and the co-integration test were adopted to assess the short run and the long run effect of oil revenue and Nigerian economic growth. However, there is room for further study on this subject both in terms of scope and methodology. The use of both qualitative and quantitative techniques in determining relative effect of oil revenue on economic well-being of Nigerians will provide more realistic results. It was discovered that there is long run benefits of oil revenue, but no such relationship in the short run. Policies geared towards achieving long run term economic growth and development should be formulated and implemented and massive investment of the rent proceeds on infrastructural development (such as education, transportation,

agriculture, communication and health) is good starting point, accompanied by sound monetary and fiscal policy to fully achieve the long run goal.

### 3.0 Proposed Research Design

The research design for the study will be ex post facto research analysis of annual multivariate time series data. According to Gujarati (2003), he stated that a model is simply a set of mathematical equations. If the model has only one equation, that means it is a single equation model but if the model has more than one equation, it is classified as multiple-equation model.

The econometric method to be used in the proposed research analysis for better estimation of the parameters of economic relationship stated above is the ordinary least square (OLS) regression method. *The study will examine general outlook and conditions of crude oil production, corruption risk and upstream oil revenue in Nigeria.* The study will focus mainly on the revenue generated from crude oil production and oil export with the purpose of assessing oil exploration and corruption with the objective of investigating Nigeria's oil export and its contribution to the growth of revenue generation and finding out if the level of corruption affects the upstream revenue generation in Nigeria. It will be useful to analyse a possible cause-and-effect relationship and predict causes.

### 3.1 Operationalisation of Concepts, Model Specification and Variable Measurement

The following multiple linear regression analysis models will be used as guide to study the four specific research objectives:

Objective 1: to investigate the causal effect of crude oil production on upstream oil revenue in Nigeria;

$$UOR=f(POR,OQ,OD,GOS,GRI,DRI,GTI,CPI)$$

$$UOR =\beta_0+\beta_1 POR +\beta_2OQ +\beta_3OD + \beta_4GOS + \beta_5GRI+ \beta_6DRI + \beta_7GTI+ \beta_8GOP + \beta_9ERV+ \varepsilon$$

Where;

UOR represents upstream oil revenue in Nigeria (Dependent variable),

POR represents Proven Oil Reserve (Independent variable)

OQ represents OPEC Quotas (Independent variable)

OD represents Global Oil Demand (Independent variable)

GOS represents Global Oil Supply (Independent variable)

GRI represents Geopolitical Risk Index (Independent variable)

DRI represents Disaster Risk Index (Independent variable)

GTI represents Global Terrorism Index (Independent variable)

GOP represent Global Oil Price (Control variable)

ERV represent Exchange Rate Variation (Control variable)

$\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8,$  and  $\beta_9$  are regression coefficients to be estimated.

$\varepsilon$  is Error term.

#### *A-priori* Expectation

$\frac{dPOR}{dUOR} > 0$ : connote that Proven Oil Reserve is expected to exert positive effect on upstream oil revenue in Nigeria;

$\frac{dOR}{dUOR} > 0$ : connote that OPEC Quotas is expected to exert positive effect on upstream oil revenue in Nigeria;

$\frac{dOD}{dUOR} > 0$ : connote that Global Oil Demand is expected to exert positive effect on upstream oil revenue in Nigeria;

$\frac{dGOS}{dUOR} > 0$ : connote that Global Oil Supply is expected to exert positive effect on upstream oil revenue in Nigeria;

$\frac{dGRI}{dUOR} > 0$ : connote that Geopolitical Risk Index is expected to exert negative effect on upstream oil revenue in Nigeria;

$\frac{dDRI}{dUOR} > 0$ : connote that Disaster Risk Index is expected to exert negative effect on upstream oil revenue in Nigeria;

$\frac{dGTI}{dUOR} > 0$ : connote that Global Terrorism Index is expected to exert negative effect on upstream oil revenue in Nigeria;

Objective 2: to examine the causal relationship between corruption risk and upstream oil revenue in Nigeria;

$$UOR=f(UOT, NPV, OB, TE, CPI, GOP, ERV)$$

$$UOR=\beta_0+\beta_1 UOT+\beta_2 NPV+\beta_3 OB+\beta_4 TE+\beta_5 CPI+\beta_6 GOP+\beta_7 ERV+\varepsilon$$

Where;

UOR represents upstream oil revenue (Dependent variable),

UOT represents upstream oil theft (Independent variable)

NPV represents Number of Pipeline Vandalism (Independent variable)

OB represents Oil Bunkering (Independent variable)

TE represents Tax Evasion (Independent variable)

CPI represent Corruption Perceptions Index (Independent variable)

GOP represent Global Oil Price (Control variable)  
ERV represent Exchange Rate Variation (Control variable)

$\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$  and  $\beta_7$  are regression coefficients to be estimated.  
 $\varepsilon$  is Error term.

#### *A-priori* Expectation

$\frac{dUOT}{dUOR} > 0$ : connote that upstream oil theft is expected to exert negative effect on upstream oil revenue in Nigeria;

$\frac{dNPV}{dUOR} > 0$ : connote that Number of Pipeline Vandalism is expected to exert negative effect on upstream oil revenue in Nigeria;

$\frac{dOB}{dUOR} > 0$ : connote that Oil Bunkering is expected to exert negative effect on upstream oil revenue in Nigeria;

$\frac{dTE}{dUOR} > 0$ : connote that Tax Evasion is expected to exert negative effect on upstream oil revenue in Nigeria;

$\frac{dCIT}{dUOR} > 0$ : connote that Corruption Perceptions Index is expected to exert negative effect on upstream oil revenue in Nigeria;

### Sources and methods of data collection

All the data that will be used in this research will come from secondary sources. Annual time series data for Nigeria will be used from .

#### 3.2 Estimating Techniques

##### 3.2.1 Descriptive Statistics and Normality Tests multivariate time series data

The following descriptive statistics, mean, median, percentage, variance, standard deviation, standard error and coefficient of variation, will be used to summarize the data. Normality of the data will be tested by skewness, kurtosis, Shapiro-Wilk test, Kolmogorov-Smirnov test and Jarque-Bera (JB) test.

##### 3.2.2 Inferential Statistics for multivariate time series data

###### 3.2.2.1 Diagnostic tests

The study will used the following diagnostic test to resolve the following econometric time series problems: Non-stationarity (Unit root)-Dickey Fuller(DF), Augmented-Dickey-Fuller(ADF), Phillips-Perron(PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) tests; Heteroscedasticity-Breusch-Pagan test, white test and Ramsey-Reset test; Autocorrelation-Durbin-Watson test; Multicollinearity-Variance Inflation Factors (VIF).

###### 3.2.2.2 Estimating Techniques

The following regression, cointegration and causality tests will be conducted on the time series data: Regression: ARDL Bound test, Johansen approach and Error-Correction Mechanism(ECM) models. Causality: Toda-Yamamoto Causality, Engle-Granger causality, Sims-Granger causality and modified WALD test. Time series regression (estimating standard error of regression(S), R-squared, adjusted R-squared and predicted R-squared) using heteroscedasticity models for prediction applying Generalised Auto-Regressive Conditional Heteroscedasticity (GARCH) model and AutoRegressive Integrated Moving average (ARIMA).

#### **4.0 Conclusion**

The study examined general outlook and conditions of crude oil production, corruption risk and upstream oil revenue in Nigeria. The study focused mainly on the revenue generated from crude oil production and oil export with the purpose of assessing oil exploration and corruption with the objective of investigating Nigeria's oil export and its contribution to the growth of revenue generation and finding out if the level of corruption affects the upstream revenue generation in Nigeria. It is discovered that the following variables are germane in the empirical studies reviewed and econometric models are conceptualized that proven oil reserve, OPEC quotas, global oil demand, global oil supply, geopolitical risk index, disaster risk index, global terrorism index, global oil price, exchange rate variation, upstream oil theft, number of pipeline vandalism, oil bunkering, tax evasion and corruption perceptions index are relevant and possible determinants of downstream oil revenue in Nigeria. An empirical study to investigate the relationship and causal effect of the above-mentioned factors are recommended for further study with a view to making reliable policy statements on revenue sustainability and highlighting and reducing the counterproductive effects of corruption risks in the exploration and production of crude oil in Nigeria.

#### **5.0 Recommendation**

Nigeria is well endowed with mineral resources with petroleum forming a major part of the natural resource mix. With 40 billion barrels of proven oil reserves and a daily production of about 2.4 million barrels of crude oil, the country has become one of the major petroleum exporters in the world. The government and transnational oil companies earn substantial revenues and profits from oil and gas exports. However, amidst growing exports and increasing revenues to national, state and local governments, poverty levels in the country have been increasing while social infrastructures collapse. Dependence on oil and gas revenues has been a major factor in the inability of the state to create an enabling environment for sustainable development with the result that that citizens are disenchanting while violence has escalated in the country.

The increasing violence in the Niger Delta complicates a social situation characterised by massive poverty and environmental degradation occasioned by the exploitation of crude oil and natural gas in the area, as corruption has robbed communities of potential benefits from the considerable federal, state and local government revenues from oil and gas sales.

The oil and gas industry is still the major source of revenue for the Nigerian government and her citizens. It is unfortunate that cases of corruption are here and there in the industry beginning from oil and gas exploration to refining and marketing of the petroleum products. Because the country so much depend on the oil and gas industry for her sustainable development and national economic growth, the high rate of corruption in the industry affects all other sectors of the nation's socio-political economy. Efforts have been made by the federal governments, management of the industry and other international bodies to eradicate corruption in the industry but it seems that the outputs of such efforts are far more than desired. The fight against corruption in the industry, the ability of the stakeholders to detect acts of corruption and present those guilty of committing them is essential to deter corruption

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