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Exploring Financing Strategies in Oil and Gas Industry: Lessons from Nigeria

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Highlights

- Historical context and economic importance
  - The Nigerian oil and gas industry has shaped the nation's economy since oil was first discovered in 1956 at Oloibiri, significantly contributing to government revenue and export income.
  - By 2023, Nigeria remains a major oil producer, with proven reserves of 36.967 billion barrels of crude oil and 5.913 trillion cubic meters of natural gas.
- Persistent financing challenges
  - Despite the enactment of the Petroleum Industry Act (PIA) in 2021 to attract investors, the sector faces significant financing gaps due to inadequate infrastructure, sabotage, and the reluctance of foreign banks to invest due to perceived risks.
  - Annual financing needs are estimated at $25–$30 billion, yet underinvestment threatens sectoral and economic growth.
- Diverse financing options
  - The study identifies financing strategies, including equity (e.g., IPOs and shareholder funds), debt (e.g., reserve-based lending and project finance), and innovative tools like Sukuk and production-sharing contracts.
  - Third-party financing methods, such as carry arrangements and swaps, are highlighted as critical for addressing capital requirements.
- Investment in infrastructure
  - Major projects like the Ajaokuta-Kaduna-Kano (AKK) gas pipeline and Port Harcourt Refinery rehabilitation underscore the need for massive investments to improve midstream and downstream infrastructure.
  - Stakeholders emphasize reducing logistics costs and enhancing operational efficiency to attract further investments.
- Policy and regulatory insights
  - The study underscores the need for continued improvements in Nigeria's legal and regulatory framework to create an investor-friendly environment and ensure sustainable growth.
  - It recommends fostering local participation in the oil and gas industry and addressing security concerns to protect critical infrastructure.
- Global relevance
  - Lessons from Nigeria's experience can inform financing strategies for resource-driven economies facing similar challenges in attracting investments and transitioning toward sustainability.

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Abstract

This study explores the intricacies and challenges of financing the oil and gas industry in Nigeria, a sector that has significantly shaped the nation's economy since the discovery of oil in Oloibiri in 1956. Despite Nigeria's substantial oil and gas reserves and the implementation of the Petroleum Industry Act (PIA) in 2021, which aimed to overhaul the legal framework and attract investor interest, the sector still faces a significant financing gap. The study examines the challenges that have hampered the sector's growth, including inadequate infrastructure, frequent sabotage, inadequate funding, and the reluctance of foreign banks to invest due to perceived risks. It also evaluates the available financing options, differentiating those applicable to local, international oil companies, and the national oil company. The research highlights the importance of selecting the best financing options for oil and gas business while exploring various financing strategies available to players in the oil and gas industry.

Keywords: Debt, Derivatives, Equity, Finance, IOCs, Natural resources

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1. Introduction

Nigeria struck her wealth when it first discovered oil in Oloibiri, a small community in the Ogbia local government area of Bayelsa State, located in the Niger Delta region, in 1956. Starting with an initial production of 5,000 barrels of oil per day, this output doubled the following year. By January 1979, Nigeria reached its peak crude oil production at 2.44 million barrels per day, making it the sixth largest oil producer in the world. As of 2023, Nigeria, the most populous Organization of Petroleum Exporting Countries (OPEC) member, has around 221 million people and occupies approximately 924,000 square kilometers along the Gulf of Guinea on Africa's western coast.

According to OPEC's 2023 annual report, Nigeria's proven crude oil reserves are estimated at 36,967 million barrels, and its proven natural gas reserves stand at 5,913 billion cubic meters. The country exports 1.38 million barrels of crude oil per day and 32,190 million cubic meters of natural gas, valued at $53.46 million. Nigeria is often referred to as a gas province with some oil due to its substantial natural gas reserves, which are noted for their high quality, being rich in liquids and low in sulfur. Currently, Nigeria produces about 4 billion cubic feet of natural gas per day, but a significant portion of this is flared. The amount of natural gas flared is estimated to be sufficient to power the entire Sub-Saharan Africa (Brown, 2023). As cited by Elehinafe et al. (2022), Abdulkareem et al. (2012) noted that the amount of gas flared is projected to be 2 bcf/d, the greatest amount of any country belonging to OPEC.

The economy's reliance on oil has steadily increased over the years, with government revenues from oil rising from 10% of GDP in the 1960s to 30% in the 1980s, driven by higher oil production, prices, and exports, which grew from 5% to 24%. However, in recent times, the oil sector's contribution to the total real GDP has declined, accounting for 6.38% in Q1 2024, up slightly from 6.21% in the same period of 2023 (NBS, 2024). This decline can be attributed to various factors: inadequate incentives, sabotage, crude oil theft, poor infrastructure, frequent changes in government policies, global economic recession, the transition from fossil fuels to clean energy, and low investment due to a lack of available funds.

On August 16, 2021, the Petroleum Industry Act (PIA) was enacted, marking the end of a 20-year effort to reform the legal framework governing Nigeria's hydrocarbon industry and to boost investor interest in the oil and gas sector. The legal changes introduced by the PIA include the establishment of two distinct industry regulators: the Nigerian Upstream Regulatory Commission (NUPRC) and the Nigerian Midstream and Downstream Petroleum Regulatory Authority (NMDPRA). The Act also restructured the national oil company, transforming it into the Nigerian National Petroleum Company Limited (NNPC Ltd), and implemented a more favorable tax and royalty structure for crude oil production while revising the terms and conditions for upstream licensing and leasing. Under the PIA, NNPC Ltd is empowered to operate across various sectors of the global energy industry and to engage in other commercially viable ventures that will deliver value to all its stakeholders.

As opportunities in the oil and gas sector in advanced markets decline due to the growing focus on new energy and sustainability, international oil companies (IOCs), investors, and service providers are shifting their investments to developing regions rather than Europe or North America. For the remainder of this decade, most industry investments will be directed toward advantaged resources—those with the lowest costs, emissions, and risks (Woodmac, 2023). However, developing new supplies will become increasingly expensive, demanding significant cash flow and investment to meet the growing demand. The repercussions of underinvestment in the sector could be extensive, potentially affecting the global economy.

Despite significant investments in Nigeria's oil and gas industry, a substantial financing gap remains. According to Abolo (2021), the annual financing needs of Nigeria's oil and gas sector are estimated to be between $25 billion and $30 billion. Over 20 major offshore oil field projects are planned, expected to add approximately 880,000 barrels per day to Nigeria's oil production over the next 3 years. These projects include vital infrastructure such as oil and gas pipelines, flow stations, the Trans-Saharan Gas Pipeline, power plants, refineries (IPMAN, modular refineries), and liquefied natural gas (LNG) projects like NLNG Train 7 and Brass LNG.

For example, the Ajaokuta-Kaduna-Kano (AKK) Pipeline Project, designed to transport natural gas from southern Nigeria to central regions for both domestic use and power generation, is estimated to cost $2.8 billion and is about 90% complete. This project is currently financed through a $2.6 billion loan from the Bank of China and a $434 million equity investment from the Nigerian Gas Company, a subsidiary of NNPC.

Additionally, the Port Harcourt Refining Company (PHRC) rehabilitation project, which has a budget of approximately $1.5 billion, is a project encompassing the Engineering, Procurement, Construction, Installation, and Commissioning (EPCIC) phases. This project reached mechanical completion in December 2023. Meanwhile, $1.48 billion is required for the rehabilitation of both the Warri and Kaduna refineries.

The Abuja Power Plant, one of three natural gas-fired power plants announced by the Nigerian National Petroleum Corporation (NNPC) in December 2017, has a capacity of 1,250 MW. The other two plants are the Kaduna power station, with a capacity of 900 MW, and the Kano power station, with a capacity of 1,350 MW. In total, 15 power plants are planned to become operational by 2037, 9 of which will be gas-fired. The combined-cycle gas turbine (CCGT) power plant will receive its gas supply through the Ajaokuta-Kaduna-Kano Gas Pipeline project and is projected to cost $2.67 million.

According to Mordor Intelligence, Nigeria's oil and gas market production volume is projected to increase from 4.60 billion cubic feet per day in 2024 to 4.93 billion cubic feet per day by 2029, representing a compound annual growth rate (CAGR) of 1.39%. To address the current financing gap, the African Petroleum Producers Organization is working on establishing an energy bank with a $5

billion fund to support upstream projects. Additionally, stakeholders emphasize the need to focus on investing in midstream and downstream infrastructure. Such investments are expected to lower logistics costs associated with transporting refined products and reduce the pump prices of petroleum products.

This work addresses the various challenges facing oil and gas financing in Nigeria, including the technical complexities and substantial capital requirements for investment across the upstream, midstream, and downstream sectors. Issues such as frequent sabotage of equipment, high security documentation costs, the complicated process of changing controlling interests, and the reluctance of both local and foreign banks to invest due to high risks contribute to the financing difficulties. Additionally, companies not listed on the Nigerian Stock Exchange struggle to raise funds from the Nigerian capital market. In light of the new regulatory framework governing the industry, this study explores the available financing options and distinguishes between those applicable to local and international oil companies, as well as the national oil company.

2. Literature review

Investment in Nigeria's oil and gas industry has been declining due to socio-economic instability and frequent incidents of infrastructure vandalism, resulting in significant revenue losses from crude oil production. This decline is evident in the ongoing reduction in the number of crude oil barrels produced daily, which has eroded investor confidence due to the inherent risks in upstream and downstream operations. This study examines the financing modalities under the current conditions, particularly with the implementation of the new Petroleum Industry Act. Previous literature has explored similar issues related to oil and gas financing in Nigeria, providing a foundation for understanding the current challenges and opportunities in the sector.

For instance, Bappah et al. (2024) investigated the effects of lease financing and capital structure on the financial performance of listed oil and gas companies in Nigeria over a 10-year period using pooled ordinary least squares (POL) and fixed effect (FE) regression analyses. Their findings indicate that lease financing negatively affects return on assets (ROA), while equity financing has a positive impact on ROA. Debt financing, however, does not have a significant effect on ROA. The study also reveals that equity and debt financing have significant positive and negative effects on return on equity (ROE) respectively, whereas lease financing does not significantly impact ROE for oil and gas companies in Nigeria.

Muhammad and Haruna (2022) explored the potential of Sukuk for financing Nigeria's oil and gas sector using structural equation modeling with the primary data collected through questionnaires and interviews. Their study highlighted that the oil and gas value chain suffered from outdated infrastructure in both upstream and downstream sectors. They suggested that introducing new financing models such as Sukuk funds could address these issues. Sukuk has been effective in capital infrastructure financing for various projects in the country. The study recommends that oil and gas companies should adopt this model to enhance investment in revitalizing refineries and downstream infrastructure, thereby improving the distribution and sales of products nationwide while also accessing capital markets for fundraising.

Additionally, Efeeloo (2021) evaluated the impact of financing mix on the market potential of quoted companies in Nigeria. Using an ex post facto research design, the study examined the effects of equity, long-term debt, and short-term debt on book value per share, with firm size as a moderating variable. The findings indicated that both equity and long-term debt positively influenced the book value per share, while firm size had a significant positive relationship with this metric for listed oil companies. The study recommended adopting an optimal financing mix to enhance shareholder wealth effectively.

In their study on the financing issues within Azerbaijan's oil and gas industry, Hasanli and Mehdiyeva (2021) observed that while the sector was a significant revenue source, it had to improve its capacity to finance large-scale, innovative, and risky projects. The study emphasizes that for the oil and gas sector to foster high rates of economic growth and enhance quality, collaboration with the government is essential. They argue for increasing the sector's competitiveness and optimizing resources use through the development of innovative activities, rather than relying solely on state financing and depreciation. The adoption of venture funds is proposed as a means to support these efforts.

In a study on alternative frameworks for oil and gas financing in Nigeria, Okonofua (2019) highlighted several strategies to address financing challenges. It was suggested that implementing the cash call exit agreement, establishing independent joint ventures (JVs), and allocating a significant portion of the petroleum equalization fund for oil and gas infrastructure development could be effective. Additionally, leveraging the benefits of the Islamic financing scheme, Mudaraba, was proposed as a potential alternative to stimulate growth and development in Nigeria's oil and gas sector.

Anyanwu et al. (2017) analyzed the financing and financial performance of the oil and gas industries in Nigeria, focusing on the intelligent capital model of oil and gas companies listed on the Nigerian Stock Exchange over an 8-year period from 2008 to 2015. Using panel estimation techniques, they found that capital employed efficiency had a positive but insignificant relationship with the return on assets, return on equity, net profit margin, and gross revenue growth. Social capital employed positively but insignificantly correlated with return on assets, while negatively affecting return on equity, net profit margin, and gross revenue growth. Human capital efficiency had a positive but insignificant relationship with the net profit margin and gross revenue growth; however, it had a negative association with the return on assets and the return on equity. The study concluded that investment in physical assets, such as modernized exploration, refining, and product storage and delivery facilities, enhanced the efficiency of oil and gas services, leading to increased turnover and revenue.

Azarkish and Varnamkhasti (2017) compared the financing methods for oil and gas projects used by the National Iranian Oil Company (NIOC) and Pars Oil & Gas Company (POGC). Their study revealed that Iran invested $49.129 billion, resulting in a gas production of 357 million cubic meters per day, while Qatar invested $109.40 billion, achieving a gas production of 597 million cubic meters per day. NIOC employed the buyback and local financing options, whereas POGC utilized the production sharing contract (PSC). The study concluded that financing through PSC was a more effective investment strategy, accelerating gas production in the common field compared to other methods.

Alonge (2014) examined financing in Nigeria's oil and gas industries, focusing specifically on investment in upstream operations by indigenous oil companies. The study found that financing for oil and gas projects in Nigeria primarily relies on equity ownership and debt secured from project sponsors, lenders, and the capital market, with debt financing being more common than equity financing. The research also highlighted that financing should not be limited to monetary contributions but should include the provision of guarantees by deposit money banks (DMBs). The study recommended adopting a legal framework similar to Norway's for upstream operations to enhance long-term commitment, promote growth, and encourage greater indigenous participation in the sector.

3. Financing options for local and international oil companies and national oil company (NNPC Ltd)

Financing oil and gas projects involves a range of risks that impact bankability, depending on the type, nature, and scale of the project. In Nigeria, both local oil companies (LOCs) and international oil companies have access to various financing options to support their operations. These financing options

often involve a combination of different methods. For the purposes of this study, these options are categorized into two main buckets: equity and debt sources and third-party financing products.

3.1. Equity and debt sources

Oil and gas companies can tap into capital markets to issue bonds or hybrid financing instruments, which combine elements of both debt and equity, to address their financing needs. In Nigeria, equity financing for oil and gas projects is typically achieved through various methods, with initial public offerings (IPOs) being a prominent approach. In an IPO, oil companies offer shares to the public for the first time, raising significant capital suitable for large-scale projects. Notable Nigerian companies that have effectively used this method include Seplat, Conoil, Ardova, OANDO, and MRS.

Another crucial source of equity financing is shareholder funds and share subscriptions. Shareholder funds involve existing shareholders providing additional capital to the business, which is especially useful during financial distress or when external funding is scarce. For example, Seplat Energy plc, an independent energy company listed on both the Nigerian Stock Exchange and the London Stock Exchange following its 2014 IPO, has generated $1.7 billion in free cash flow. Additionally, there are plans for Dangote Refinery to be listed on both the Nigerian and London stock markets.

Share subscriptions involve either existing or new investors purchasing additional shares issued by a company, thereby infusing fresh equity into the business. This approach helps companies maintain liquidity and ensure operational continuity without relying solely on debt, thereby preserving financial stability amidst market volatility. For instance, NNPC Ltd, which recently transitioned from a state-owned entity to a commercially driven company, has announced plans for an initial public offering (IPO) in 2024. The company is reportedly 80% prepared for the IPO, as disclosed by the group chief executive officer (GCEO) during the Adipec conference in Abu Dhabi in 2023. This suggests that the NNPC will be able to fund its numerous projects and channel more funds into exploring more basin for discovery of oil and gas.

Additionally, many international oil companies and local oil companies use debt financing, which involves traditional loans from banks and financial institutions to support capital expenditures and working capital needs. For example, Phase 1 of the Trans Nigeria Gas Pipeline, also known as the AKK Pipeline (Ajaokuta-Kaduna-Kano Pipeline), was financed with a $2.6 billion corporate loan from the Bank of China and a $434 million equity investment from the Nigerian Gas Company, a subsidiary of NNPC (Global Energy Monitor, 2024). The Dangote Refinery, the world's largest single-train refinery with a capacity of 650,000 barrels per day and a total cost of $25 billion, was financed with a 50% equity contribution and 50% debt finance through syndicated loans from Nigerian deposit money banks and Afrexim Bank, with the Central Bank of Nigeria providing $130 million for domestic currency needs (The Africa Report, 2024). Similarly, in 2021, Ardova plc raised NGN60 billion ($146 million) through a bond issuance program to fund its expansion and working capital.

Another significant source of equity financing is through cash calls under a joint operating agreement (JOA), where partners in a joint venture request additional capital contribution from shareholders to support ongoing operations or new ventures. This approach not only secures necessary funds but also dilutes ownership, distributing financial risk across a broader base of investors. It is a common practice globally, and many assets in Nigeria are managed and financed through this method. For example, TotalEnergies Producing Nigeria (TEPNG) holds a substantial 40% stake in the NNPC/TEPNG joint venture. Additionally, TotalEnergies Gaz Electricite Holdings France (TGEHF) holds a 15% interest in Nigeria LNG, overseeing six LNG liquefaction trains on Bonny Island. The company also has strategic non-operated interests in various high-profile projects, including a 10% share in the joint venture

operated by Shell Petroleum Development Company (SPDC), a 12.5% stake in the Bonga field, and a 20% interest in the Usan field.

The production sharing contract, first developed in Indonesia in 1966 to provide host governments with greater control over their resources, is similar to the joint operating agreement. A PSC is a contractual arrangement between a government and an oil or gas exploration and production company, designed to govern the exploration, development, and production of hydrocarbon resources in a specific area. As of 2023, PSCs account for approximately 46% of Nigeria's total crude oil production (NURPC, Report 2023). This arrangement facilitates risk transfer, reducing financial risks for the host country and allowing the host community to benefit from the expertise of the IOC. Under a PSC, the produced oil is divided between the host government and the contractor. The initial portion is allocated to royalties, followed by an allocation for cost recovery to cover operating expenses and repay exploration and development costs. Most offshore oil and gas assets in Nigeria fall under this arrangement. For example, TotalEnergies Upstream Nigeria Limited (TUPNI) operates the significant Akpo and Egina fields within the OML 130 deep-water area, alongside SNEPCO and Sterling Oil Exploration and Production.

Another notable financing option is Islamic Sukuk, investment certificates or notes that represent proportional ownership in tangible assets, usufructs, services, or investments in specific projects adhering to Shariah principles. Unlike conventional bonds, Sukuk are interest-free and provide the holder with ownership rights to the underlying asset, entitling them to a share of the returns generated by that asset. Sukuk is not limited to Muslim investors as it conforms to ethical standards and principles of justice. The common types of Sukuk include Ijara (lease) Sukuk, Murabaha (cost-plus-profit margin sale) Sukuk, Musharaka (profit and loss sharing partnership) Sukuk, Mudaraba (profit sharing and loss bearing partnership) Sukuk, Istisna (construction/manufacturing financing) Sukuk, and Salam (sale with spot payment but deferred delivery) Sukuk.

For example, in 2023, the Vibes reported that Malaysia's SMJ Sdn Bhd issued its maiden Islamic medium-term notes worth up to RM900 million based on the Shariah principle of Sukuk Wakalah, which was significantly oversubscribed. Sukuk can be attractive to conventional investors if they offer reasonable risk-adjusted returns and are effectively marketed. They are particularly appealing to environmentally-focused investors if they fund sustainable projects. According to Mohammed and Haruna (2022), Sukuk financing presents a promising investment opportunity that could significantly enhance the Nigerian oil and gas sector, especially in revitalizing the country's refineries.

3.2. Third-party financing options

Third-party financing products provide oil and gas companies with a range of funding options from external financial institutions. Traditional corporate loans, usually offered by banks, are a standard means of obtaining capital for various business needs, including expansion and operational costs.

First, acquisition financing is crucial for supporting mergers and acquisitions, promoting growth and market expansion. In the global oil and gas sector, 257 mergers and acquisitions (M&A) transactions were reported in Q1 2024, totaling $73.3 billion, according to the deals database of GlobalData. In Nigeria, Seplat Energy's acquisition of Eland Oil and Gas in December 2019 marked the first time a Nigerian company bought a UK-listed firm. In 2022, the Nigerian National Petroleum Company took over OVH Energy Marketing (OVHEM), which operates the Oando downstream assets, adding over 380 filling stations to the NNPC Retail brand in Nigeria and Togo, thereby making it Africa's largest petroleum retail network. In 2024, Oando plc also agreed to acquire a 100% stake in Nigerian Agip Oil Company Limited (NAOC Ltd) from Eni.

Similarly, Equinor and Chappal Energies have agreed on the sale of Equinor Nigeria Energy Company (ENEC), which holds a 53.85% interest in oil and gas lease OML 128, including a 20.21% stake in the Agbami oil field operated by Chevron. Mergers and acquisitions enable companies to achieve economies of scale, capitalize on each other's strengths, and enhance resource management and efficiency. These transactions also offer opportunities to acquire new reserves, enter new markets, and diversify geographic presence, thereby improving financial stability and access to capital.

Reserve-based lending (RBL) is designed specifically for the oil and gas industry, enabling companies to borrow against the value of their proven reserves. This financing option aligns well with the sector's unique asset structure. In 2021, Seplat Energy plc, an independent Nigerian energy company, announced that its subsidiary, Westport Oil Limited, secured a $50 million reserve-based lending facility linked to offtake agreements, with a due date of November 2023. Additionally, it obtained a $100 million RBL facility with a five-year term, expiring in April 2027. This effort, supported by the Nigerian government, aims to boost local participation in the oil and gas sector and fund asset development and acquisitions. Another instance is the $3.3 billion loan of NNPC Ltd from Afrexim Bank, secured against crude oil output. RBL offers flexibility by allowing financing based on anticipated production, mitigating market value uncertainties, and minimizing additional costs such as interest while providing a reliable source of capital.

Project finance (PF) is designed for funding large, standalone projects such as new oil field developments or infrastructure initiatives. It relies on the cash flow generated by the project itself for repayment, rather than the company's overall balance sheet, thereby isolating the project's risk. Originally used to develop oil fields in Texas and Oklahoma during the 1930s, PF has since been effectively employed to increase oil production in the North Sea and other global locations. For example, in 2022, a $1.4 billion external project finance agreement was secured for hydrocarbon projects in the Niger Delta to support Project Panther, part of the NNPC Limited–Chevron Nigeria Limited joint venture.

Swaps are derivative contracts in which two parties agree to exchange periodic payments based on specified terms and frequencies. These contracts are used to lock in the price of an underlying asset in advance, with the parties agreeing to exchange future payments periodically. For swaps involving commodities like Brent, WTI, RBOB, HO, Gasoil, Jet Fuel, and FO 3.5%, there is no physical exchange of the commodity itself; instead, only the cash flows resulting from the difference between the fixed and variable prices are exchanged. Swaps help manage price risk in the market. For oil products, they can be used to hedge against price increases (beneficial for utility companies) or decreases (beneficial for producers). For example, in November 2023, the Nigerian National Petroleum Company Limited executed a swap of 9 million barrels of oil, worth $755.74 million, under its direct sale, direct purchase (DSDP) arrangement. However, following the Nigerian government's removal of fuel subsidies, NNPC Limited has ended all DSDP contracts, which had been in place since 2016.

Another financing option is the carry arrangement (CA) and modified carry arrangement (MCA). In a carry arrangement, an oil company or operator finances petroleum operations on behalf of all parties, including the NNPC, and recovers its costs partly through tax deductions and partly from oil production. In this setup, the carrying party is repaid in crude oil, which could be sold at higher prices, potentially benefitting the operator more than the owing party.

The modified carry arrangement, on the other hand, is similar but involves the NNPC lifting the crude, selling it, and paying the carrying party in cash rather than in crude oil. This arrangement promotes greater transparency and accountability by ensuring repayment is made in cash rather than in oil. Additionally, the MCA allows IOCs to use capital allowances under the petroleum profit tax (PPT) to

recover 85% of the principal loan, effectively reducing their taxable profit. For example, in 2009, the Nigerian National Petroleum Company entered a modified carry agreement worth $1.69 billion with SPDC, TOTAL, and Nigerian Agip Oil Company (NAOC) to finance their joint venture upstream project in Gbaran-Ugbidie, Bayelsa state.

Other financing methods include overriding royalties and operational/current future cash flow. Overriding royalties involve a percentage of production or the value derived from production being paid by the lessee or working interest owner. This percentage is calculated free of all drilling and production costs and is a form of payment to the royalty owner. Operational or current future cash flow represents a crucial internal financing source for oil and gas companies. Generated from daily operations and anticipated future revenue, this cash flow provides a reliable and consistent source of capital. Companies can finance ongoing projects, maintain equipment, and support exploration efforts without accumulating additional debt by reinvesting these funds. This method supports sustainable growth and enhances financial stability by relying on internally generated funds.

Another important financing strategy is raising capital through asset disposals. Companies frequently sell off non-core or underperforming assets to generate capital that can be redirected to more strategic initiatives. For example, in 2024, the NUPRC announced that several international oil companies, including Shell Petroleum Development Company, Nigeria Agip Oil Company, Mobil Producing Nigeria Unlimited, and Equinor, planned to divest themselves of 26 oil blocks in Nigeria to indigenous firms. This approach enables companies to streamline their operations, concentrate on high-return projects, and boost overall efficiency. Asset disposals may involve selling mature oil fields, surplus infrastructure, or other non-essential assets. Oil and gas companies can optimize their capital structure, reduce debt, and enhance shareholder value by effectively managing their asset portfolios.

Hedging, while not a direct financing method, is essential for managing financial risk by stabilizing cash flows and reducing exposure to volatile commodity prices. For example, oil and gas companies can use forward sale contracts, also known as forward purchase agreements or advance payment facilities. These contracts involve a lender agreeing to purchase a specified amount of crude oil at a fixed price, with the payment made in advance and the oil delivered at a later date.

In September 2021, the NNPC entered a forward sale agreement with Lekki Refinery Funding Limited to supply 35,000 barrels of crude oil per day. This agreement was part of a $1.036 billion funding arrangement used to finance the investment in Dangote Refinery. NNPC acquired a 20% stake in the refinery for $2.76 billion, with $1.036 billion coming from Lekki Refinery Funding Limited. Of this amount, $1 billion was allocated to Dangote Refinery, and $36 million covered the transaction costs. Similarly, Afreximbank Limited provided a $33 billion crude oil repayment loan to NNPC to enhance dollar liquidity, stabilize the Naira, and reduce fuel prices. Table 1 summarizes the funding options.

Table 1

Summary of funding options

Funding	Types
Equity	Public offers/private placement; right issues; private equity, private placements
Debt	Reserve-based lending, project finance; equity bridge loans, emergency liquidity facility (ELFs); Hybrid financing, convertible bonds/loans/preference shares

Funding	Types
Alternate financing options	Carrying arrangement; modified CA, carried funding arrangement; farm-outs, strategic agreements; asset disposals; operational current or future cash flow, financial and technical strategic arrangements, Sukuk, prepayment arrangements
Derivatives	Forwards, futures, and swaps

4. Conclusions and recommendations

The financing challenges in Nigeria's oil and gas sector are multifaceted, encompassing both technical and economic issues. While the Petroleum Industry Act has provided a more structured legal framework, significant hurdles, including the high cost of capital, security concerns, and the complex processes involved in financing, remain. The reluctance of foreign banks to fund projects in Nigeria due to the associated risks further exacerbates these challenges. The study concludes that without addressing these issues, particularly the financing gap, Nigeria's oil and gas industry may struggle to reach its full potential despite its vast resources and strategic position in the global energy market.

This study therefore recommends that the Nigerian government should prioritize investments in midstream and downstream infrastructure to reduce operational costs, improve efficiency, and make the sector more attractive to investors. There is also a need to encourage more local companies to participate in the oil and gas sector, thereby reducing the reliance on foreign investment and fostering a more resilient domestic market. There should be a concerted effort to mitigate the risks of sabotage and protect collateral securities so as to improve the security of oil and gas installations. This could involve a combination of government intervention and private sector collaboration.

Furthermore, the establishment of an energy bank by the African Petroleum Producers Organization is a positive step. However, further efforts should be made to facilitate access to capital for companies operating in the sector, particularly those not listed on the Nigerian Stock Exchange. Lastly, there is a need for continuous improvement in the legal and regulatory environment which is necessary to reduce bureaucratic hurdles and create a more investor-friendly climate, thereby attracting both local and international investors.

Nomenclature

CA	Carrying arrangement
IOCs	International oil companies
JV	Joint ventures
LOCs	Local oil companies
MCA	Modified CA
NUPRC	Nigerian Upstream Petroleum Regulatory Commission
PIA	Petroleum Industry Act
PSC	Production sharing contracts
RBL	Reserve-based lending

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