The Potential of Sukuk for Financing Oil and Gas Sector in Nigeria

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Abstract

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Nigeria has promising investment opportunities in the up and downstream sectors of the oil and gas industry that need financing. In the upstream, there are an estimated 37.2 Billion proven oil reserves and 182 Trillion cubic feet of natural gas. New investment opportunities are being developed, and individual and organizational investors need to finance their activities by purchasing drilling equipment and financing their infrastructures and storage facilities. Sukuk financing became a potential investment opportunity that could significantly address the upstream and downstream oil and gas sector and restore the glory of refineries in the country. There are currently three petroleum refineries in Nigeria with a stated capacity of 438 750. Perhaps the refineries are obsolete and bedeviled by poor management and turnaround maintenance due to the lack of funding. The study examines the potential of Sukuk financing oil and gas in the sector in Nigeria. The study employed Structural Equation Modeling to test the respondents' perspectives on the proposed model. Findings predict that the government may diversify and look for an alternative for funding that attracts more investors to participate in Sukuk financing. Future research is encouraged to use quantitative assessment methods to assess funding priorities between the Upstream, middle and downstream petroleum sectors.

Keywords: *Sukuk financing, Upstream, Downstream, Oil & Gas.*
JEL Classification: *G17, G23, G31, G38*

I. Introduction

Crude oil exploration began in Nigeria in 1937 when Shell Darcy acquired a monopoly over Nigeria (Amuda-Kannike, Abila, and Abila, 2020). The first commercial discovery in quantities was Crude oil in 1956 when Shell D'Arcy successfully drilled the first well in Oloibiri in the province of Bayelsa (Adeola et al., 2021). The same year, Shell Darcy renamed and changed its original name to Shell-BP Petroleum Development Company of Nigeria Limited (Ogbuigwe, 2018). In 1957 the development activities continued, and the first shipment of crude oil from Nigeria was recorded in 1958 (Minton, 2020). The first cargo of crude oil was shipped to England in February 1958 (Adeola et al., 2021). From there, the country's economy continues to grow, and the demand for the country's petroleum has met the importation. After Nigerian independence, the Shell-BP Petroleum Development Company realized the opportunity needed in the country to meet the product demand. After realizing the demand, the country launched a project to build the country's first refinery at Port Harcourt and a capacity of 38,000 barrels per day. The Nigerian Government owns 50% under a participatory agreement with Shell BP, which was completed and began operations in 1965. That time the Nigerian Government registered as the Nigerian Petroleum Refining Company (NPRC) in 1972, and later when the Nigerian Government increased its share to 60%, it remained a joint venture under the control of the Nigerian Petroleum Refining Company (Ogbuigwe, 2018).

Before the Nigerian National Petroleum Corporation (NNPC) was established in 1977. Established by merging the Nigerian National Oil Corporation (NNOC) and the Ministry of Petroleum, the NNPC was primarily staffed by trained professionals. An International Private Sector Oil Company (IOC) has been recruited to expand Nigeria's capabilities and become an active player in Nigeria's burgeoning oil industry. It may be necessary to mention that oil geopolitics influenced some decisions in the early days of the Nigerian industry. Olorunfemi (2020) shows that Nigeria joined the Organization of the Petroleum Exporting Countries (OPEC) in 1971, and OPEC was established in 1960 to synchronize the member countries' oil policies on technical and economic assistance amongst the members (Watts, 2021). The success stories in 1960 and 1970 of the oil boom became one of the biggest countries producing oil and the most affluent in Africa. Therefore, NNOC embarked on a project to build its second refinery in Warri. The Wari refinery project was completed in December 1977 and started working in early 1978. The refinery produced a 100,000 bpsd conversion unit with a naphtha catalytic reforming unit (CRU) and a gasoline catalytic conversion unit (FCCU). Again, all the country's needs for petroleum products were fully met by the two existing refineries (Omozue, 2022). Economic activity grew in both the North and South of the country. The products were transported using rail and trucks to Kano and Kaduna, as well as the rest of Northern Nigeria, which experienced rapid growth, with forecasts again showing a demand to exceed the capacity of the two existing refineries in the mid-1980s. As such, the government decided to build another third refinery in Kaduna, close to high-demand areas in the Northern. The Kaduna Refinery was completed and began operations in 1980. The maintenance is usually carried out at due cost. In

addition, the related expenses consist of maintenance costs, staffing benefits, and salaries, all met with revenue generated by the refineries without intervening federation accounts and paid the profit and dividends to the government.

The declining performance of the refineries started in the early 1990s when the military junta ordered NNPC to close their bank accounts and move the generated funds to the Central Bank of Nigeria. The autonomy of NNPC has lost its autonomy. Therefore, the system started losing direction and was increasingly exposed to political intervention and manipulation through interference and direction, and continued to lose prompt maintenance. Most importantly, decisions regarding when to perform turnaround maintenance and which contractor to perform it were made under the influence of the government rather than in-house experts. After that, it went downhill quickly (Omozue, 2022).

Premium time (2020) reported that three refineries - Warri, Port-Harcourt, and Kaduna are not processing crude due to cleanup operations. As of June 2020, the three refineries are not processing crude oil, with a combined recovery efficiency of 0.00%, mainly due to ongoing refinery cleanup operations." As a result, no crude oil and transport costs were associated with the three refineries. However, operating costs were N10.27 billion, which the report said resulted in an operating loss for the refineries of N10.23 billion. The analysis shows that Warri Refining Petrochemical Company Limited recorded an operating loss of N2.68 billion, Petrochemical Company Limited of Port-Harcourt Refining recorded an operating loss of N2.76 billion, and Petrochemical Company Limited of Kaduna Refining also recorded the highest N4 .79 billion operating loss. Further, the decreased operating performance due to ongoing refinery upgrades is expected to improve capacity utilization upon completion. It became clear that it was accounting for from 2014 to 2018 lost N1.64 trillion. According to the report, 2014 recorded a total loss of N208.6 billion for PHRC and KRPC. N25.28 billion in 2015. N29.06 billion in 2016. In 2017, N412 billion, and in 2018, N475 billion were the combined losses. Many Nigerians have called for the privatization of refineries to avoid constant losses from them (Olujobi, Olarinde, and Yebisi, 2022).

Therefore, funding and maintenance of the oil and gas sector become fundamental; such can be achieved once the government can invite investors to invest in the system where the services and maintenance should be shared and maintained by both parties based on partnership. It indicates that people embezzle government property and are less concerned about government-owned systems. In addition, the management performance is extremely good while it is owned by different parties as the team must have a target for a stipulated period and sustainability. Farhan and Purwanto (2020), on the data released by NNPC in 2020, 54.24 million barrels of crude oil were produced in May 2020, averaging 1.75 million barrels per day. This represents a 29.27% decrease in average daily production compared to the average daily output in April 2020. This decline in productivity reported by the group can be attributed to various problems experienced at various terminals, such as pump issues and Brass Clough Creek due to repairs and leaks along the production line.

All issues exist in oil and gas and refineries as a result of Bad governance, and a lack of patriotism leads the country's up and down steam in a serious mess. Currently, financing is highly needed to fund the sector; however, it cannot be sustainable even funded as managers would embezzle the fund as indicated above. The alternative system is Sukuk investments as a joint investment to the government where the Sukuk fund would fund the refinery activities, and Sukuk subscribers are conscious of the system activities. Furthermore, the Sukuk must be suitable for the system if the government needs participation as a ratio population of Muslim 55% and others 45 in the country. Moreover, the story of Sukuk in the country is flourishing. Therefore, the research needs to examine the potential Sukuk funding as an alternative way of funding refineries to revive the glorious success of up and downstream activities for sustainable growth in the country.

II.   Literature Review

2.1. Background theory

Sukuk is an Arabic word, the plural of sak, which means "certificate or to stamp a document" (Eris, 2021). It is a generic used as the term for "note," "certificate," or "bond." Generally, it refers to a Shariah-compliant (Echchabi, Aziz, & Idriss, 2018). A Sukuk is a "right to participate in the underlying asset" (Saripudin et al., 2012). Sukuk is defined in different ways in the literature. However, we will focus only on the three most authoritative definitions. The Accounting and Audit Organization for Islamic Financial Institutions (AAOIFI) defines a *Sukuk* in Shariah Standard as "representing an undivided ownership interest in tangible assets, beneficial interests, and services, assets of a particular project, or special investment activity."Certificate of Equivalent Value" (Saad, Haniff, & Ali, 2016). The Islamic Financial Services Board (IFSB) is "a certificate representing the proportionate ownership of the holders of the undivided portion of the underlying asset, which the holders are entitled to own. The Securities Commission of Malaysia (SC) defined a Sukuk in its Islamic Securities Directive 2004 as "a document or certificate representing the value of the property" (Jaafar & Brightman, 2022). Comparing the three definitions above, the definition provided by SC Malaysia is broader and includes the other two definitions. However, there are differences between the types of assets that qualify under the regulators' (Frick, 2019). Government Investment is the placement of several funds or financial assets in the long term for investment in shares, debt securities, or direct investment to obtain economic, social, and other benefits. Government investment is carried out through shares, debt securities, and direct investment (Khan, Hussain, Bano, & Chenggang, 2020). While "shares" is referred to as listed or traded on the stock exchange (Sondakh, 2019). In addition to the shares referred to above, Government Investment can be made in shares that are not listed and not traded on the stock exchange under the provisions of laws and regulations (Cumming, Johan, & Pant, 2019). Purpose of Issuing Sukuk In the Law on SBSN (State Sharia Securities), in article 4, it is explained that the purpose of issuing Sukuk is to finance the State budget, including financing the construction of infrastructure projects in the energy, telecommunications, transportation, agriculture, industry, manufacturing, and public housing sectors (Hendratni, Soemarsono, & Harsono, 2021). The government's objective in

issuing Sukuk is to finance the budget, including financing project development. Article 4 of the SBSN Law states in Indonesia indicates that the purpose of the SBSN (State Sharia Securities) being issued is to finance the State Revenue and Expenditure Budget, known as the State budget, including financing project development (Hendratni, Soemarsono, & Harsono, 2021). Projects that can be financed with Sukuk are energy, telecommunications, transportation, agriculture, manufacturing industries, and housing. In addition, this is to expand the source base of state or company budget financing, encourage the development of Islamic financial markets, create benchmarks in the Islamic financial market, diversify the investor base, develop alternative investment instruments, optimize the use of state-owned or corporate assets, and utilize public funds that have not been captured by the conventional banking and bond system (Manab & Sujianto, 2016; Muhammad, Dauda & Mamman, 2018). As discussed below, some categories of Sukuk-based structures are also indicated (Lahsasna, Hassan, & Ahmad, 2018).

Apart from being an investment instrument in accordance with Islamic sharia, Sukuk investment is also a relatively safe investment because it has a relatively low level of risk. This is because Sukuk is an asset-based investment; each Sukuk issuer must have assets that can be used as underlying assets (Mat Radzi & Muhamed, 2019). Therefore, Sukuk is an ideal tool for liquidity management and facilitating the arrival of funds from investors, and they are also a relatively safe investment instrument. After all, they are asset-based investments (Delle Foglie, 2021).

Infrastructure Sukuk, a general term for infrastructure, refers to the technical or physical infrastructure that supports the structural network, usually in the form of the construction of railways, roads, clean water, reservoirs, telecommunications, electricity, and ports. Functionally, infrastructure, in addition to facilities, can also support the smooth running of community economic activities and the distribution of the flow of production of goods and services. For example, roads can facilitate the distribution of goods to the community (Hendratni, Soemarsono, and Harsono, 2021). As mandated in Law Number 19 of 2008, in Indonesia concerning State Sharia Marketable Securities or State Sukuk, State Sukuk can be issued to finance the government's general budget deficit and infrastructure. The issuance of Sukuk for infrastructure financing is also a step for the government to gather public participation in financing development.

The Nigerian government's issuance of Sukuk infrastructure financing has been implemented since 2017 since the Sukuk issuance with the Project Based Sukuk (PBS) series. The first mechanism used is to use government projects listed in the government budget as the underlying assets of the Sukuk. The second mechanism the government promotes is initiating to request infrastructure financing through the issuance of Sukuk since it was proposed to the National Development Planning Agency (Surachman, Hermawan, Handayani, and Astuti, 2022). This mechanism can ultimately become a driving force for any responsible agencies signed to supervise and monitor a complete infrastructure work in a transparent and accountable manner. The government believes that the issuance of Sukuk will become one of the main sources of infrastructure financing

in the future because the opportunities are very large, such as policy support for infrastructure financing through Sukuk insurance which is reflected in the enactment of law concerning Government Securities. In addition, the regulation authorizes the government to use a property or budgetary estimation as the underlying asset and finance the allocation. In contrast, other countries used the State budget percentage or property of the State budget of Sukuk or State Sharia Securities (SBSN) issued based on sharia principles as evidence of the share of State Sukuk Assets in Indonesia (Laila and Anshori, (2021).

2.3. Previous Studies

AAOIFI at least recognises different Sukuk structures based on liabilities, assets, equity, and services (Azmat, Skully & Brown, 2017). The structure is based on three basic forms of Islamic finance, namely Murabaha (Purchase Order), Musharaka/Mudarraba (Profit Sharing Agreement), Ijara (Sale-Leaseback), or any combination thereof (Darmansyah et al., 2020). A Sukuk representing ownership or usufruct in real estate is tradable and can be traded. If it is a debt or vice versa can only be exchanged at face value (Manan, 2019; Muhammad, Ngah, and Obad, 2022). Since its inception, Sukuk has provided working capital to businesses and governments worldwide. However, it has also been criticised on many fronts. These include the perceived contribution to economic growth and development, the structure and compliance with Shariah rules, the existence of the underlying assets, and investors' rights to those assets (Azmat, Skully & Brown, 2017).

Similarly, Echchabi, Aziz & Idriss, 2018) explored the relationship between Sukuk financing and economic growth in the case of Bangladesh. The study used quarterly data from 2004 through 2011 and applied cointegration and Granger causality tests. Their findings indicated a unidirectional relationship between Sukuk financing and economic growth in the short and long term. Seth, Singhania, and Siddiqui (2022) studied the relationship between Sukuk financing and economic growth in selected Middle East and North African countries. The authors used unbalanced panel data set and applied system GMM estimation for the dynamic panel model. Their findings indicated no significant relationship between Sukuk financing and economic growth in the selected markets. However, the weakness of this research is that the countries selected are of different economic and financial development, and the spread between these two might not be consistent across MENA countries. Thus, the output of the study might be biased. In a related context, Mensi, Hammoudeh, Tiwari, and Al-Yahyaee (2020) examined the relationship between Islamic finance and economic development in the case of Kuwait from 2004 through 2011. The authors applied cointegration, VECM, and granger causality tests to attain their objective. Their findings revealed no association between the two elements in the short or long run. It is worth noting that the studies scrutinising Islamic finance and the economic growth nexus have considered aggregate Islamic financing without identifying the pure effect of Sukuk financing (Banna, and Alam, 2021; Muhammad and Ngah, 2020). The latter is considered one of the significant sources of financing under Islamic finance.

2.4. The current state of Sukuk markets in Africa and Nigeria

Regional Financial Integration in Sub-Saharan Africa relied heavily on external grants and concessional loans to finance capital expenditures and government deficits. Only a few countries have access to global capital markets (Zogning, 2017). Since the global financial crisis, Sub-Saharan African member countries have increasingly used international investors as a source of funding for their governments. This has enormous potential as it helps countries compensate for low domestic savings, further diversify their investor and cope with reduced access to concessional finance benefits (Lam & Law, 2018). African markets are generally small and undemanding, leading to inefficiencies and barriers to competitive financing. Countries form Regional Economic Communities (RECs) to develop their domestic markets with different regional agendas. Only four RECs in Africa are engaged in regional financial integration, expanding and deepening financial ties within the region (Yu, 2017). Sukuk is currently trending to address deficit budget financing to mitigate and reduce fuel poverty and promote Islamic finance while further strengthening regional financial integration (Muhammad & Salisu, 2019).

Recently, the Nigerian government and corporations have increasingly turned to the capital markets to raise funds from investors who are inclined to a specific form of ethical debt instruments known as 'Sukuk'. . Sukuk is expected to continue to attract particular attention from some of the world's largest institutional investors, who see it as potentially the most effective way to diversify their investment portfolios in Nigeria. The Federal Government of Nigeria (FGN) is improving its Sukuk issuance policy and appears to be moving towards its first issuance on the international market alongside more sovereign domestic issuances. Gelos, Sahay & Sandleris (2011) state-owned Sukuk will promote financial inclusion by diversifying the range of products available to investors in the domestic financial market, broadening the investor base, and attracting several first-time retail investors. This latest 10-year Sukuk is the fourth issuance by the Debt Management Office, bringing his gross Sukuk in Nigerian Naira equivalents to £612.57 billion (US$1.49 billion). FGN insures Sukuk with a fixed rent of 12.8% per annum. Several local financial institutions were involved in the transaction.

Investor appetite for Sukuk is underscored by an unprecedented subscription level above N865bn ($2.09bn). The Nigerian government considers Sukuk one of the most valuable and accepted financing products. Kang, Lee & Park (2010) indicates that the domestic financial market is open to domestic and foreign investors. Demand for FGN Securities in the domestic market is strong" Nasreen et al. (2020) justify that Sukuk certificates are available to institutional and individual investors. The analysis shows high enrollment levels from banks and fund managers (including pension funds), non-interest (Islamic) financial institutions, ethical funds, cooperatives, and individual investors. The individual investor journey is profitable, exceeding 5% in the first edition in 2017, 17.33% in the second edition in 2018, and over 18% in the third edition in 2020. The growing stage of participation, with the aid of using a greater numerous and large range of traders, pressured the Debt Management Office, "is an affirmation that the Debt Management Office's targets of issuing

sovereign Sukuk to develop the home investor base and sell monetary inclusion is being achieved. In addition, the excessive subscription stage is evidence of traders' acknowledgement of the effect the primary 3 Sukuk issuances totalling N362.577bn ($880m) issued between 2017 and 2020 has had at the improvement of avenue infrastructure in Nigeria." The disappointing issue of Nigeria's first mover benefits in infrastructure-related Sukuk a marketplace for quasi-sovereign, company, and social issuances. Salaudeen (2021), FGN Sukuk IV has numerous sustainability attributes. These consist of accountable investing (the proceeds are committed to tangible avenue infrastructure projects; financial inclusion for non-hobby traders with the purpose additionally of similarly growing the financial savings subculture in Nigeria through moral funding for ethically minded traders; low danger because the certificate is assured with the aid of using the FGN; liquidity for the reason that certificate may be traded on the two pinnacle neighbourhood inventory exchanges and qualify as liquid property for banks and different institutions; and the Sukuk certificate can be used as collateral for securing credit score centres from monetary institutions.

2.5. Conceptual framework of up and downstream

Upstream issues related to production

The three Nigerian refineries are located in the North-west and two in South-South, and NNPC built a network of pipelines to supply the refineries with crude oil and discharge the products (Merem et al., 2018). Refineries were designed to receive crude feedstocks in pipelines (Ogbuigwe, 2018). It is likewise designed to discharge products through pipelines (Khan et al., 2019). The main purpose of lifting products from the depot right next to the refinery was to supply the surrounding towns and communities (Ogbuigwe, 2018). The disruption of crude oil and product pipelines began in the late 1990s (Albert, Amaratunga, Haigh, 2019). Several studies attempted to elucidate the reasons for this development. There are main reasons for the blatant crude oil and petroleum products theft. It is argued that the two are related. Several publications deal extensively with these issues. In summary, the Niger Delta region of Nigeria, primarily producing oil, has been a hotbed of resource management agitation (Albert, Amaratunga, Haigh, 2019). This is due to the unfair perceptions people felt about the worsening of the population and claims of bearing the brunt of pollution.

Approach of the United States of America to pipeline safety and security

In the United States, a federal pipeline safety program was approved under Regulatory Certainty, Pipeline Safety, and the Act of Job Creation 2011 (Burns, 2020). The 2012 law contains a wide range of pipeline safety and security provisions. The Federal Pipeline Safety Program was also launched by the Department of Transportation (DOT) shortly after the September 11, 2001, terrorist attacks (Kheraj, 2020). However, the Pipeline Safety Agency was later replaced by the Department of Homeland Security when it was created and transferred to the Department of Homeland Security (Humphries, 2019). The Department of Transportation and the Department of Homeland Security have different mandates but work together to protect the country's pipelines. In addition to being vulnerable to

accidents, pipelines can be intentionally damaged by vandals and terrorists (Burns, 2020). Pipelines can also be vulnerable to "cyberattacks" against supervisory control and data acquisition (Choubineh, Wood, & Choubineh, 2020) systems and attacks against power grids and communication networks. Oil and gas pipelines are prime targets for terrorists, extremist groups, and organized crime worldwide (Romsom, 2022). On December 17, 2003, President Bush issued Homeland Security Presidential Directive 7 (HSPD-7), clarifying law enforcement responsibilities for setting priorities and protecting critical infrastructure (Ugwueze & Onuoha, 2020). In regulating the movement of hazardous materials by all routes (including pipelines) (Holeczek, 2019). The order requires DHS and other federal agencies to cooperate with "appropriate private sector entities" to share information and protect critical infrastructure (Ditta, Figueroa, Galindo, & Yie-Pinedo, 2019). The Council's role is to work with industry peers to coordinate programs to protect critical infrastructure in the energy and transportation sectors and to facilitate secure information sharing. HSPD-7 also called on DHS to develop a national plan to protect critical infrastructure and essential resources (Rehak et al., 2019), and the agency launched the National Infrastructure Protection Plan (NIPP) in 2006. For each critical infrastructure sector, the NIPP outlines strategies for securing critical infrastructure, outlines coordinated approaches to enhance security efforts, and outlines these requests for preparing a Sectoral Plan (SSP) establishing adequate funding for its activities (Choubineh, Wood, & Choubineh, 2020).

A careful review of the Oil Pipelines Act of 1990 (and the Oil Pipeline Regulations enacted thereunder) provides penalties for violations of pipelines and for obstructing the flow of crude oil or refined petroleum products (Adebayo, 2018). However, the Other Fireplace Act [12] Section 1(7) does not allow any person to intentionally or willfully rupture, damage, cut, tamper with, block, destroy, or impede the free flow of crude oil or refined products through a pipeline (Ogwang, & Vanclay, 2021). A criminal case is convicted to life imprisonment if found guilty. However, criminal offences under this law can only be prosecuted in federal court. On the other hand, Oil Production and Distribution (Anti-Sabotage Act) (Ogbuigwe, 2018). Article 1 stipulates that a person who intentionally does anything to impede or prevent the procurement of petroleum products in any part of Nigeria shall be guilty of obstruction (Albert, Amaratunga, & Haigh, 2019). Section 2 states that an individual could face up to 21 years in prison or the death penalty if convicted (Holeczek, 2019). However, the federal courts are exclusively responsible for Section 3. The sanctions provided by the relevant laws are severe, but the lack of thorough prosecution of crimes has made the text null and void, and impunity is rising as vandalism continues (Fombad, 2020). The government must implement existing sanctions against the pipeline and economic sabotage violations (Olujobi, Olarinde, & Yebisi, 2022). Congress should harmonize the Oil Pipeline Act and align it with other laws and the Oil Trade Act to ensure the downstream sector (Norouzi, & Fani, 2022). In addition, the Federal Department of Justice urgently needs to participate in granting fiat currency to enable the private prosecution of criminals. Considering the above issues and the current challenges of funding Nigerian refineries, there is an opportunity for interested investors to participate in

refining petroleum products in Nigeria. Even with all existing refineries running at full capacity, the demand for Nigeria's petroleum products remains strong. Current total product demand equates to a refining capacity of 800,000 bpsd. Therefore, we need at least 300,000 bpsd of additional capacity as of 2018. By 2028, assuming a 3% annual growth rate, the refining capacity deficit will increase to about 550,000 bpsd. In addition, Nigeria supplies petroleum products to neighbouring African countries through unofficial routes. Investors may aim to formalize this. Dangote Group has decided to invest in the construction of 650,000 bpsd refineries, which are expected to be operational by 2023 or shortly after. The conventional refining capacity is 450,000 bpsd, with the remaining 200,000 bpsd reserved for petrochemical feedstocks. There is still room to build another facility in Greenfeld with a capacity of at least 250,000 bpsd to meet Nigeria's needs. Higher capacities are justified when supplying the Western and Central African regions.

Downstream deregulation

Knowledge of deregulation theory provides insight into combating the corruption and incompetence prevalent in the industry. The two theories underlying this work are the resource curse theory and the sustainable development theory. The resource curse theory was developed from 1970 to 1990. Such a theory is mainly based on the fact that countries rich in natural resources often experience disastrous economic development compared to those with poor natural resources (Tshinu, 2022). This is due to the declining competitiveness of other sectors of the economy and the poor management of oil revenues. The model supports research by asking emerging economies to overcome the dilemmas associated with resource-rich countries, such as extreme poverty, scarcity, and expensive petroleum products. However, these countries are also vulnerable to abundant oil. Blessed, poor social infrastructure and oil infrastructure are the biggest challenges to the country. Symptoms include a weakened regulatory system, internal instability, and corruption in public service (Khadzhyradieva, Slukhai, & Rachynskyi, 2020). Deregulation will protect and prioritize functioning refineries and Nigeria's social, economic, and environmental interests to meet current needs and maintain those needs for future generations. It aims to ensure the promotion and development of the downstream petroleum sector through a coherent regulatory framework. Through sound institutional and regulatory changes, emerging economies must ensure that the downstream oil sector promotes efficiency generation. It also underscores the need to enhance Nigeria's social and economic development through its abundant oil resources for sustainability and the benefit of its citizens. This theory supports research by emphasizing the need for consistent enforcement of existing legal frameworks for the downstream petroleum sector in all oil-exporting developing countries. The theory further argues that oil-rich countries are unwilling to deregulate thrift and extractive resources to eliminate the prevalence of bribery. It stresses that it lacks economic growth to match its abundance of energy resources. Boost output growth to end the various challenges associated with subsidy payments, including corruption and inefficiency. Therefore, existing mining industry transparency laws and other mandatory environmental laws must be strictly enforced to protect the industry's social, commercial, and ecological welfare (Olujobi, 2021).

The oil industry is the country's main source of income and suffers from an inherent and pervasive challenge of corruption. This has hindered development and economic development in Nigeria. Despite current trends in the use of alternative energy sources and the scarcity of fossil fuels, governments are taking various steps to efficiently address these challenges through deregulation models (Olujobi, 2021). The government is expected to use oil revenues for real growth in the country by eliminating subsidized spending that leaves room for industry corruption (Schaffitzel et al., 2020). To address Nigeria's fuel shortage, the federal government has launched modular oil refinery projects and other private partnership projects. Domestic refining of crude oil with a capacity of 445,000 barrels per day is underway to address domestic fuel shortages, but these operations have not yet delivered the desired results (Olujobi, 2021). In line with (Umeji & Eleanya 2021), deregulation is the cure for industry corruption. This will improve regulation and good governance (Schaffitzel et al., 2020). Their research highlighted the benefits of complete deregulation and solutions to ongoing fuel price hikes, product shortages, and more. Similarly, Moghaddam, & Wirl (2018) argued in their paper that rising fuel costs are not due to a complete lack of deregulation but to rising global oil prices. The benefits of full deregulation were ignored in this study, as rising fuel prices would encourage financial development as oil commodities are rigid. However, the current authors believe full deregulation would reduce the country's fuel shortages, and a new strategy of Sukuk financing claims to be the solution. Similarly, Chelminski (2018) argued that fuel subsidy schemes were introduced to mitigate the negative impact of rising fuel prices, but over N1.7 billion was spent on subsidy payments. Nevertheless, the problem remains due to corruption. Sobowole (2012) also suggested that industry deregulation would create healthy competition within the industry, thereby eliminating control of the sector by NNPC. Mills' (2019) deregulation applications lead to financial waste and social problems caused by the government's over-control of the industry. A downstream of this study are challenges from downstream petroleum activity and related issues. Itsekor (2020) emphasizes that deregulation of the downstream oil industry is a tool for economic development and the survival of the downstream oil industry. Olujobi, Olujobi, & Ufua (2020) emphasizes that the gains from deregulation are enormous, as they aim to eliminate vast amounts of revenue spent on subsidies. Around N25 trillion (US$65,616,797,500) was spent between 2006 and 2009, necessitating the end of subsidies. Oljovy et al. (2020) examine the deficiencies of laws regulating the marketing of petroleum products. Still, this study is limited by an implicit assessment of laws regulating the marketing of petroleum products within the country. The survey could not discuss issues related to the full deregulation of the industry based on funding and was not fully explored, but it provided information on deregulation policies. Therefore, the development of Islamic financial markets creates benchmarks in the Islamic financial market, diversifies the investor base, develops alternative investment instruments, and optimizes Sukuk to finance the petroleum Upstream and Downstream of the Nigerian petroleum industry to reform its glory, as earlier stated with advanced innovations.
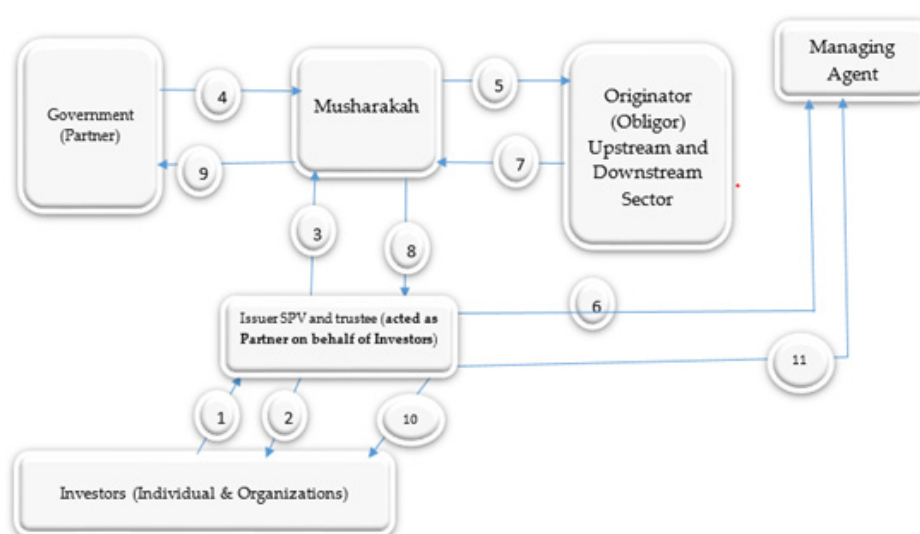
Figure 1: Proposed Model Framework

1.   Cash from the investors, both individual and organization
2.   A certificate of holding Sukuk from the SPV will be issued to you
3.   The investment is to be channelled to the Musharakah pool, which the Government also generated based on a percentage
4.   The government perceives the stipulated rate and the contribution of the Government in cash or kind
5.   The Musharakah investments channelled to the Upstream and Downstream for proper management by the agents
6.   SPV appoint a manager for maintenance
7.   Upstream and Downstream activities fund generated channelled to the Musharakah agreement
8.   Share percentage of the investor paid to the SPV
9.   Share portion of the government partner to be channelled to the Government
10. Periodical distribution of the profit to the Investors
11. Incentive payment of the hired management

In the Sukuk al-Musharaka transaction, the two partners in the joint venture/partnership are a special purpose vehicle (SPV) that brings in cash (revenue for issuing Sukuk), also known as Sukuk Musharakah. It is a form of Sukuk derived from Musharakah joint venture or partnership structures. In the Sukuk al-Musharaka trade, the two partners in the joint venture/partnership are:

The entity (Originator) seeks funding that brings in assets or funds. When cash is raised by a special purpose vehicle (SPV) (revenue from issuing Sukuk), the Originator and SPV enter a management agreement under which the Originator manages the assets and invests the cash under the Musharaka Covenant and Shariah. For example, the Originator must not invest funds in prohibited (haram) products and services. If Musharaka is a separate legal

entity, the management contract will be executed by Musharakah. Based on pre-agreed percentages, profits from Musharakah will be divided between the SPV and the Originator. However, the loss will be shared based on capital contributed by the partner's initial investment. The SPV will use a portion of its profits to pay the Sukuk holders.
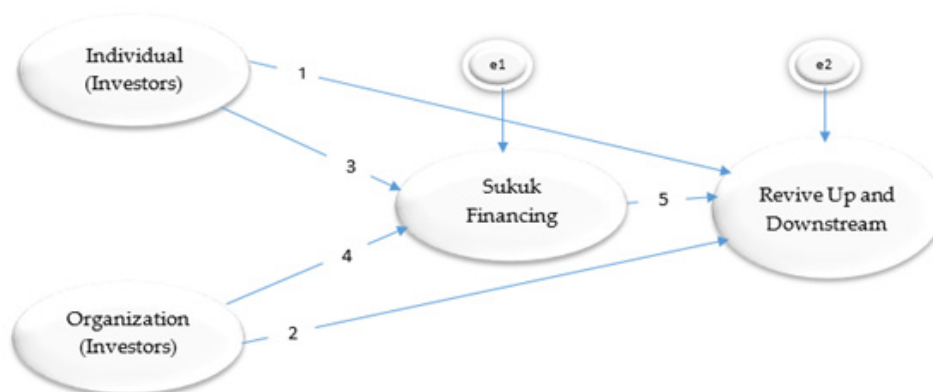

Figure 2: Testing Model Measurement

H1   Individual investor has a significant effect on Revive Upstream and Downstream

H2   Organisational investor has a significant effect on Revive Upstream and Downstream

H3   Individual investor has a significant effect on Sukuk financing

H4   Organisation investor has a significant effect on Sukuk financing

H5   Sukuk financing has a significant effect on Revive up and Downstream

Mediation test

H6   Individual investors can enhance Upstream and Downstream through Sukuk financing

H7   The organizational investor can enhance Upstream and Downstream through Sukuk financing

III.   Methodology

This study examines the condition of upstream and downstream Nigeria's oil and gas sector to overcome the issue related to the oil and gas trilemma for sustainable development through Sukuk financing based on Musharakah for sustainability and revive the glory of the refineries in the country. Therefore, the study assessed people's perspectives based on the above-proposed approaches to address the proposed and developed frameworks. However, socioeconomic is the related social and economic development of communities, which eases the security and maintenance of the system that will assist the organization or institution in decision-making and link to the sustainable development of Nigeria's oil and gas sector. The conceptual frameworks are developed based on the proposed model in Figure 1, referred to as financing investment in the upstream and downstream oil and gas sector, and Figure 2 used a survey

questionnaire to assess the view and people's perspectives toward restoring the existing refineries in the country. The research questionnaire uses Structural Equation Modeling (SEM) and SPSS to confirm the acceptability and the relationship between the upstream and downstream funding of the oil and gas sector.

3.1. Data collection

Data was collected from oil and gas experts, collaborators of NNPC, financial experts, and Islamic finance experts. The study obtained data from such individuals to avoid biased results. The total number of questionnaires returned was 300 for analysis. This is important in structural equation modelling, as recommended by (Kline, 2015), for identifying relationships and improving the sustainability and acceptability of the model. However, in Structural Equation Modeling, we performed such tests using flexible and lightness model tests to understand how to overcome the situation in the sector. Variable predictors are used in measurement and latent variable construction (Bisbe & Malagueño, 2015). SEM shielding is an index reflected in the analyzed structures. Reliability and validity were also used to determine data consistency. Composite reliability, Cronbach's alpha, Average variance Extracted (AVE), and convergent discriminant validity were examined to confirm the precision of study variables. Based on the investment Framework under Sukuk Musharakah's mode of financing. This study, proposed with the help of Sukuk (Islamic capital markets), offers a solution to address the cooperation of sister organizations willing to engage the system and address oil and sector in the country for the country's development. A proposed project requires a certain number of partner organizations. The government provides Sukuk funds, refinances them as loans to partners, and attaches some technical specifications to the loans under Musharaka financing. Partner organizations stand as investors represented by SPV for sharing formulas and providing adequate and accurate understanding to members as business initiators and Sukuk issuers.

Table 1. Demographic Analysis

Category	Frequency	Percentage
Age		
18-39	60	20%
40-50	150	50%
51-above	90	30%
Gender		
Male	210	70%
Female	90	30%
Education		
Degree	195	65%
Master	80	26.5%
PhD	25	8.5%

Expertise		
Financial expert	150	50%
Oil & Gas expert	105	35%
Islamic Finance expert	40	13.5
Others	5	1.5

The descriptive demographic analysis is to assess the percentage of each category of the respondent. The Age consists of three categories 18-39 has 20%, 40-50 carries 50% of the respondents, and 51-above has 30%. For the gender, the Male gender got 210 and the Female 30%; the analysis indicates that the educational level of the participants consisted of Degree, Master, and Ph.D. The Degree of participation is 65%, Master 26.5%, and Ph.D. 8.5% are categorised into three different areas for the result justification, the financial experts 50%, oil and gas experts 35%, Islamic financial experts 13.5%, and other groups of respondents 1.5%.

Table 2. Model Credibility

R	0.818
R Square	0.669
Adjusted R Square	0.666
Std. Error of the Estimate	0.437

Variables	Unstadrd. Coeffic.		Standard Coeff.	t	sig
	B	Std. Error	Beta		
Constant	0.82	0.161		5.041	0.000
Individual Investor	-.002	0.028	-.003	-.085	0.932
Organization investor	0.117	0.029	0.130	3.980	0.000
Sukuk Financing	0.710	0.031	0.764	22.598	0.000

*Dependent variable: Rev_Up and Downstream

The table indicated the acceptability of the selected study variables using R square, and an adjusted R square test was used to identify the credibility of the model, which indicates the acceptability at 66%. Therefore, the variables model credibility is loaded perfectly (Israeli, 2007).

IV. Result and Analysis
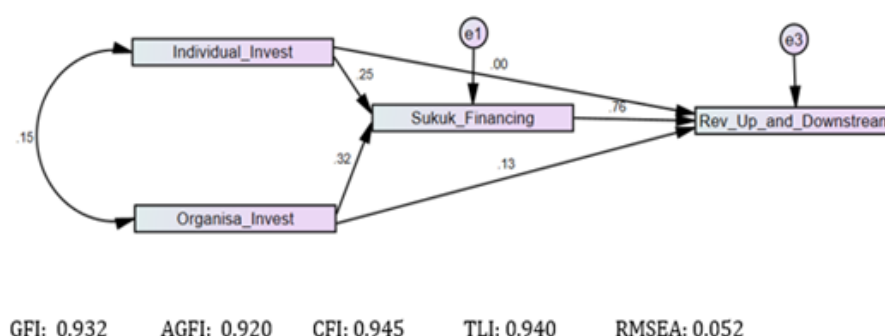
4.1 Results

Figure 3: Model Measurement

GFI: 0.932   AGFI: 0.920   CFI: 0.945   TLI: 0.940   RMSEA: 0.052

Table 3. Measurement Model

Abbrv. fit	Loaded fit	Theories	Acceptability
P-value:	>0.00	Chau (1997)	Below
X2/df:	0	Bagozzi and Yi (1988)	Acceptable
GFI:	3.213	Kline (2010)	Acceptable
AGFI	0.932	Chau and Hu (2001)	Acceptable
CFI	0.920	Bentler (1990)	Acceptable
TLI	0.945	Hair et al. (2006) and Ho (2006)	Acceptable
IFI	0.940	Ho (2006) and Hair et al. (2006)	Acceptable
RMSEA	0.925	Byrne (2001) Hu & Bentler (1999)	Acceptable

Table 3 indicates the measurement of the disclosed model and describes all part of the test that perfectly meets the required cut-off. Therefore, the X2/df should ensure below (<5.0), which loaded 3.213 that, shows the level of acceptability as recommended by (Bagozzi & Yi, 1988). For the GFI, AGFI, CFI, TLI, and IFI, there is a level of a threshold above (>0.9). The cut-off all have been met. Only RMSEA has a different stipulation of the threshold of (<0.8) as indicated by (Byren, 2001). The above measurement indicates 0.052, which loaded as predicted.

Table 4. Validity and Reliability

Testing variables	Cronbach's Alpha	Composite reliability	AVE
Individual Investor	0.739	0.737	0.707
Organisational Investor	0.786	0.808	0.721
Sukuk financing	0.720	0.822	0.641
Revive upstream and Downstream	0.704	0.809	0.721

The validity and reliability testing was carried out based on the model's internal consistency and data accuracy. Cronbach's Alpha indicates the reliability of the variables met the minimum requirement of (>0.7), the same scenario with Composite reliability at (>0.7) as recommended by (Fornell & Lacker 1981). While the average variance extracted must be above the threshold of (>0.5) to meet the required cut-off, as seen above the minimum requirement. Therefore, Cronbach's Alpha, Composite reliability, and Average variance have met the minimum test requirements, and the validity and reliability were accepted.

Table 5. Discriminant Validity

Variable	(1)	(2)	(3)	(4)
Individual Investor	**0.841**			
Organisational Investor	0.786	**0.849**		
Sukuk financing	0.720	0.822	**0.800**	
Revive upstream and Downstream	0.704	0.809	0.721	**0.849**

The discriminant validity test indicates the latent testing variables and distinct of the latent variables based on the Average variance extracted square root and indicates the good loading as all variables were in between the range below (<0.85) as recommended by (Kline, 2010). Therefore the loadings of discriminant validity are still in the recommended value range.

Table 6. Hypothesis Testing

Variable	Estimate	S.E	C.R	P	Label (H)
IV - > RUD	-.002	.028	-.086	0.932	Reject H1
OI - > RUD	.117	.029	3.997	0.000	Supported H2
IV - > SF	.239	0.46	5.216	0.000	Supported H3
OI - > SF	.305	0.47	6.544	0.000	Supported H4
SF - > RUD	.710	.031	22.69	0.000	Supported H5

The analysis in table 6 above indicates the hypothesis testing based on the direct effect of the variables. The IV rejected the relationship with RUD C.R -.086 with a p-value of 0.932 and rejected (H1). While the OI and RUD relationship was positive, the C.R. of the relationship was 3.997, and the p-value was 0.000. Therefore, H2) is supported. In addition, the other hypotheses of H3, H4, and H5 indicate the positive and supported relationship as predicted.

Table 7. Mediating Hypothesis

Variable	Direct effect	Indirect effect	Total effect	Label (H)
IV - > SF-> RUD	.239 (0.046)	.710 (0.031)	0.033 (0.000)	Full mediation
OI - > SF-> RUD	.117 (0.028)	.710 (0.031)	0.020 (0.000)	Partial Mediation

Table 7 above indicates the mediation level of Sukuk financing between the individual and organizational investor and Rev_up and downstream sector of the oil and gas sector. The first hypothesis, H7, indicated full mediation as a direct effect rejected and accepted indirect effect through mediation. Therefore, it points to the relevant Sukuk financing in developing up and downstream of the oil and gas sector. In addition, the organizational investor indicates partial mediation, whereby the relationship between direct and indirect effects was reliant. Therefore, the immediate impact of H1 has a p-value of 0.046. In contrast, the indirect effect has 0.000, and the total effect indicates a positive effect and therefore indicates full mediation, and other hypotheses of H2 have partial mediation.

Table 8. Description of Factor Loading

Item	Description	Factor Loading
IV1	Individual Investors are aware of the opportunity individual investor to feel confident in investing in the oil and gas sector.	0.637
IV2	Individuals are aware of investment processes in the oil and gas sector.	0.636
IV3	An investor can invest through Sukuk financing for oil and gas.	0.695
IV4	An individual is aware of the processes and instruments of financing through Sukuk	0.710
IV5	Individuals and organizations can be potential investors in the oil and gas sector through Sukuk.	0.860
OI1	Organizational investors can partner with the government in funding the oil and gas sector.	0.720
OI2	Organizational institutions can be used to restore the glory of the oil and gas sector.	0.730
OI3	Organizational investors can use Sukuk to finance oil and gas in Nigeria.	0.718
OI4	Organization investors can address funding through Sukuk to overcome challenges and problems in the oil and gas sector for proper management and accountability.	0.730
OI5	Individuals and organizations can be potential partners to overcome challenges upstream and downstream of the oil and gas sector through Sukuk investment.	0.710
SF1	Sukuk financing may be used to eliminate the decay of the oil and gas sector in Nigeria.	0.629
SF2	Sukuk financing can be used for individual and organizational investment to find the oil and gas sector.	0.822

SF3	Sukuk financing can be used to overcome funding challenges upstream and downstream of the sector	0.878
SF4	Sukuk is considered a potential way of funding upstream and downstream	0.877
RUD1	Upstream challenges can be addressed using Sukuk funding.	0.720
RUD2	Downstream challenges can be addressed using Sukuk funding.	0.808
RUD3	Reviving the sector is obtainable using Sukuk funding.	0.710
RUD4	Individual and organizational investors can use the funding for the oil and gas sector to address the oil and gas sector.	0.630
RUD5	The research potentially promotes government in policy-making based on funding upstream and downstream of the oil and gas sector	0.740

Hair et al. (2017) found that the factor loading of the construct of each factor must be above (0.5). However, any standardized factor loadings loaded below (<0.5) are considered irrelevant and poorly loaded, as indicated by (Fornell & Larcker, 1981). Therefore, the higher the factor loading, the more relevant and positive the constructs.

4.2. Discussion

According to the study, Nigeria's upstream and downstream petroleum industry is not sufficiently funded due to the carelessness of leadership and corruption in other angles in collaboration with the Ministry of Petroleum, the Department of Petroleum Resources (DPR), Nigerian National Petroleum Corporation (NNPC), and the Petroleum Products Marketing Company (PPMC). This has led to institutions collapsing and inadequate funding for refineries despite the large allocation to fund the sector. The budgeted allocation will be embezzled without making the system function. The former regimes of different government authorities made the systems work through partnership, and an effective strategy was implemented to run the system. However, after the Nigerians owned the sector in totality, the system collapsed and made the role of national agencies decay in upstream and downstream petroleum enablement. According to Ogbuigwe (2018), inadequate turnover and regular maintenance of refineries led to refinery collapses and fuel shortages, leading to an increase in fuel, spoilage, and product scarcity. This hit and deprived the economy hard. The causes of the artificial shortage of domestically refined petroleum products are inadequate maintenance of existing refineries, reduced crude oil allocation, hostility, corruption, mismanagement, smuggling, pipeline vandalism, and poor roads. However, the main concern of this research is to address upstream and downstream funding through Sukuk Musharakah financing for sustainable development need for strict and comprehensive legislation monitoring and maintenance of the sector to reduce the sabotage and unethical activity in the sector. Overhauls, restructurings in the oil sector, and diversification of the production base in other sectors have been revealed. The study explored the need to address the deterioration of petroleum infrastructure to facilitate the distribution of petroleum products in Nigeria. This study provided valuable policy options for saving the sector. However, the study's validity and reliability met the requirement as indicated in tables 3, 4, 5, and 6, while tables 7 and 8 discuss the direct and mediating hypotheses for the justification of the research.

V.   Conclusion and Recommendation

5.1 Conclusion

The study explored downstream deregulation of the Nigerian petroleum sector and advocated the industry's need for complete deregulation. Not only that, but this study also utilized existing literature to provide a proposed conceptual framework for the model. This reform will transform NNPC into a fully commercial and viable for-profit legal entity with the opportunity to raise funds from the capital markets through the provisions of the oil industry. Nigeria has a significant supply shortage of petroleum products. The lack of functioning refineries and the resulting severe pressure on infrastructure from imports was a significant cause of the supply shortage. Complete deregulation of downstream oil would end the shortage of Nigeria's petroleum commodities and increase the sector's efficiency. There is room for further research to gain insight into various aspects of deregulation.

5.2. Recommendations based on Managerial Implication

I.   Licenses to more investors to a partner, regardless of individual or organization, make our Upstream and downstream functioning oil refineries, the standard panacea, a cost-effective investment option for investors. It can be located within an existing refineries or onshore fringe field. Refineries must operate fully to meet daily fuel consumption capacity through turnaround maintenance through Sukuk financing.

II. Ending the subsidy system will require strong political will and recognition among all stakeholders and the Nigerian public of the benefits of full deregulation in the industry.

III. Political will, if adopted, these measures would provide a favourable environment for successful deregulation policies in Nigeria's downstream through strict application of mitigation measures that mitigate the negative impact of full deregulation of the downstream oil industry on Nigerians.

5.3. Future research

Due to confidentiality, sufficient data downstream of the oil and gas industry are not much, and some are afraid of disclosing it; however, it impacts Nigeria's economic growth. Sukuk financing can also be relevant for sustainability and efficient monitoring by regulators. The study tried to delve into the wider sector space, secrecy, and scarcity of funding. Future researchers are encouraged to use quantitative assessment methods to assess funding priorities between the Upstream, middle and downstream petroleum sectors to complement the current literature in this area.

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