Global Crude Oil Price, Oil Revenue and Economic Performance: Dutch Disease Hypothesis

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Abstract

The purpose of this paper is to give a general understanding of the global crude oil price, oil revenue and economic performance vis-à-vis Dutch disease proposition. This work explores the relationship between the price of crude oil and its oil revenue generation on the regions of the Organization of the Petroleum Exporting Countries (OPEC) and non-Organization of the Petroleum Exporting Countries (non-OPEC). The crude oil price has recently been fluctuating greatly that it cannot be predicted; this fluctuation causes changes in the oil revenues, thus affecting the economy worldwide. To better understand the factors that affect the crude oil price, this study examined West Texas Intermediate (WTI), Brent, Dubai oil and OPEC oil prices whether the Global oil fluctuation in these countries have a significant effect on the fluctuation of Oil revenues. Various studies have confirmed the importance of crude oil prices to the global economy. This study focuses on the relationship between crude oil prices and oil revenue levels. However, therefore, in addition to the in-depth understanding of the relationship between oil prices and oil revenues, the relationship other variables and oil prices is valuable and worthwhile topic to explore. The findings of the studies reviewed revealed that the agriculture sector, manufacturing and telecommunication sector exerted a positive and significant impact on Nigerian economic performance and diversification dwindling oil revenue should be invested heavily on productive non-tradeable sector according to Dutch diseases hypothesis (Riti et al., 2016).

Keyword: Global crude oil prices, oil revenue, economic performance, Dutch disease hypothesis, research gaps, systematic reviews, framework, model formulation.

JEL classification code: H2, C22, Q43. E39, I31

1.0   Introduction

There are many economic reasons for managing the price of crude oil (Raouf, 2021). As history has shown, the impact of high crude oil prices on national economies can be quite severe and can give rise to serious discontent among the citizens and politicians of the oil-consuming economies of the U.S., Western Europe, Japan, and others (Yang, 2019).   There have been repeated pressures on oil producing nations in general, and on OPEC in particular to study oil prices to prevent the global economy from sliding into a recession (Balcilar & Ozdemir, 2019).

Crude oil is traded internationally in US dollars per American Petroleum Institute (API) barrel of 42 US gallons at 60 °F and atmospheric pressure, also known as stock tank barrel (stb) (Scheitrum et al., 2018). Crude oil differs greatly in physical properties and quality because of the varying conditions responsible for its formation. Some of the properties of crude oil include density, pour point, sulphur content, API gravity and colour. Because of the differences in the properties if oils, they are primarily categorized according to their API gravity and sulphur content (Bourghelle et al., 2021). These two properties are important in determining the commercial value of oils. API gravity is a measure of oil gravity compared to the gravity of water, expressed in degrees. The higher the API gravity of crude oil, the lighter the oil. Sulphur content also represents the amount of sulphur present in the oil expressed in percentage by weight in crude. Crudes with negligible amount of sulphur are termed sweet crude whilst sour crudes have significant sulphur content.

The amount of entrained water and salt content in crudes also influence the price refineries are willing to pay for each barrel of crude oil, regardless of where in the world it is produced (4). Some of the major crude oil price benchmarks include; West Texas Intermediate ("WTI", United States), Brent Blend (North Sea, Europe) and the OPEC reference basket made up of 13 (as tabulated below) blends across OPEC member countries (Scheitrum et al., 2018). Prices of these benchmark crudes are highly correlated; WTI and Brent have been almost equal for decades, with their spread for twenty years averaging at $ 1.44 in favor of WTI (Cross & Nguyen, 2017).

Crude Oils in OPEC Reference Basket for OPEC Spot Price

S/NO	NAME OF CRUDE OIL	COUNTRY
1	Saharan Blend	Algeria
2	Girassol	Angola
3	Djeno	Congo
4	Zafiro	Equatorial Guinea
5	Rabi Light	Gabon
6	Iran Heavy	Islamic Republic of Iran
7	Basra Medium	Iraq

8	Kuwait Export	Kuwait
9	Es Sider	Libya
10	Bonny Light	Nigeria
11	Arab Light	Saudi Arabia
12	Murban	United Arabic Emirates
13	Merey	Venezuela

Source: OPEC Annual Statistical Bulletin, 2022.

Nigeria being among the members of the Organization of the Petroleum Exporting Countries (OPEC)does abide by the benchmark of prices of crude oil set by OPEC for all the oil producing countries on four classifications according to their grades; (i) West Texas Intermediate (WTI) – Texas Light Sweet with grade of crude oil used as a benchmark in oil pricing. It was also described as light because of its relatively low density and because of its low sulfur content. (ii) Market Average (MA) – price of crude oil U.S. dollars per barrel based on average in the market. (iii) Bonny Light (BL) – a high-grade crude oil with high API gravity (low specific gravity). (iv) Brent (BR)-trading classification of sweet light crude oil that serves as a major benchmark price for purchases of oil worldwide (Ayoola & Olanrewaju, 2018).

According to Energy Information Administration (EIA) Bulletin (2022), In June, 2022 the global benchmark, the Brent crude oil futures was down trading at \$116.66 per barrel while the United States benchmark, the West Texas Intermediate crude futures was trading at \$115.80 a barrel. Organization of Petroleum Exporting countries and its allies, an oil cartel known as the OPEC+, has Crude oil is an essential commodity and dominates many aspects of global economics and politics. There are two major benchmarks for world oil prices, West Texas Intermediate (WTI henceforth) crude oil and Brent crude oil, which are both light and sweet. WTI refers to oil extracted from wells in the US and sent via pipeline to Cushing, Oklahoma (Caro *et al.*, 2020). The supplies are land-locked, and it is relatively expensive to ship to certain parts of the globe. Brent refers to oil from fields in the North Sea. Because the supply is water-borne, it is easier to transport to distant locations. As of November 2020, crude oil made up 43.72% of the entire Standard and Poor Goldman Sachs Commodity Index (S&P GSCI) in terms of dollar value, of which WTI and Brent accounted for 25.31% and 18.41%, respectively (Geyer-Klingeberg & Rathgeber, 2021). WTI plays a leading role in the global crude oil market (e.g., Klein, 2018; Liu et al., 2018).

Previous studies have suggested a set of WTI determinants, such as convenience yield, inventories, transportation costs, and open interest (Tudor & Anghel, 2021; Heath, 2019). A number of studies attribute the price of WTI to the increase in oil production in the US, due to the shale oil revolution, the infrastructure development from limited capacity to an expanding number of pipelines, and the policy changes such as removing the ban of exporting crude oil, etc. (Caporin et al., 2019; Liu et al., 2018).

Given the strategic needs and interactions of the demand and supply side, oil prices are perhaps best viewed as set by a consensus of major buyers and seller (Caldara et al., 2019). In fact, Caldara et al. (2019) noted the beginning of the first such crude oil price management in history begins when in March 1983 "OPEC slashed its prices by about 15 percent – from thirty-four to twenty-nine dollars a barrel." Quotas were allocated and Saudi Arabia assumed the role of the swing producer to manage the price. With the increased supply came downward pressure on prices and in 1983, OPEC shifted its strategy from administered prices to production quotas. With the largest level of reserves, Saudi Arabia took on the role of swing producer and saw its market share fall the most (Feng et al., 2020). Consequently, in 1986 the country established a new netback pricing system that guaranteed refining margins to oil companies and ultimately led to a downward price spiral from $26 per barrel in 1985 to less than $10 in mid-1986. This low oil price devastated the economies of Texas and the Southwest. Eventually, Vice President Bush visited Saudi Arabia to make a case for higher prices. As Chapman and Khanna (2000) note, the logic was that a price in the $15-$20 range would "encourage U.S. political support of Persian

Gulf governments threatened by Iraq or other forces seeking monopoly over Persian Gulf oil."

What is clear is that OPEC production remained steady at 3.1 or 3.2 million barrels a day for the years 2003-2008 despite the fact that the prices went from around $30 to around $140 by June, 2008. On the other hand, the OPEC production capacity utilization ranges from 93 percent to 97.2 percent in the period which could have hampered additional production. But then, capacity creation itself is a strategic decision and the capacity utilization ranged from 89 percent to 97.6 percent in 2003 portending a higher utilization in the future (Chapman & Khanna, 2006).

The crude oil market has undergone different regimes based on the behavior of OPEC and the emerging importance of non-OPEC production – Russia, West Africa etc. This suggests that OPEC possessed a strong ability to influence prices despite demand and supply shocks, other disruptions, and the fact that non-OPEC production had already surpassed OPEC production in 1982. In the first subperiod, where the $15-$20 range was applicable, the futures price closed below $15 only 248 times out of 3,015 trading days. Also, the 1983-1985 period is where OPEC established a price of $29 per barrel and Saudi Arabia took on the role as the swing producer (Chapman & Khanna, 2001).

2.0   Statement of Problem

The huge increase in oil revenue as an aftermath of the Middle-East war of 1973 generated unprecedented, unanticipated and unexpected wealth for Nigeria, and then created the vivid shift of policies from an all-inclusive method to benchmarking them against the State of the oil sector (Akinlolu & Nejo, 2020; Efanga et al, 2020). The discovery of oil and gas has had a major effect on the Nigerian economy both positively and unfavourably. On the destructive side, this can be measured with reverence to the close communities within which the Oil Wells are exploited. Some of these communities suffer environmental degradation, which leads to the dispossession of sources of livelihood and other economic and social factors. Uremadu et al, (2020) noted that though huge earnings are gotten from the domestic sales and

export of petroleum products, its consequence on the growth of the Nigerian economy as regards returns and productivity is still doubtful. Furthermore, given the fact that the oil industry is a very critical segment of the Nigerian economy, there is the need for a suitable and necessary production and export policy for the sector (Akinlolu & Nejo, 2020). In Nigeria, however, crude oil has contributed largely to the economy; the revenue has not been appropriately employed. Bearing in mind the fact that there are other sectors in the economy, the excess revenue made from the oil and sector can be invested in them to diversify and also increase the total gross domestic product of the economy (Efanga et al, 2020).

Eze et al (2018), Yahaya and Yusuf (2019), Akinlolu and Nejo, (2020), Efanga et al, (2020), Uremade et al (2020) argue that the over-reliance on oil revenue has a tendency to mislead and depress sourcing of revenue from other sources by the government. For instance, as a result of enormous oil revenue flows; countries tend to de-emphasize taxes as a source of government revenue. It is expected that the crude oil sale proceeds ought to have been sufficient enough to provide for the well-being of Nigeria populace. But over-reliance of crude oil for revenue amidst the oil price fluctuations has affected the economy owing to the fact that oil price had been considered a benchmark for the nation's annual budget (Manasseh et al., 2019).

In a mono-economy like Nigeria, oil price fluctuation is capable of militating against the conceptualisation and determination of budget assumptions and estimates due to its attendant consequences of depleting the oil revenue, poor allocation and mismanagement of the revenue for government capital expenditure (Mohammed & Sani, 2020).

But experience from the fall in oil prices from around $114 a barrel to below average of $50 per barrel between 2010 to 2015, dipping further below $35 a barrel, which was further predicted to crash to $20/barrel in 2018 by IMF has shown that consistent fall in oil prices causes more damage on the well-being of citizens of oil dependent countries like Nigeria and on fiscal management of oil revenue (Orhewere & Ogbeide-Osaretin, 2020). This experience drag the Nigerian economy into chronic recession which brought about high level of austerity, ranging from double digit inflation, low capital investment rate and productivity, devaluation of currency, low per-capita income, high rate of debt servicing and foreign reserve depletion among others. This reduced not just the revenue accruable to Nigeria, but the allocation of fund to capital projects in the country.

Though, in the quest to reduce the effect of this shock, the authorities was forced to lower its oil revenue projection to N820 billion from oil exports in 2016 based on a benchmark price of $38/barrel from a projected oil earnings of N3.9 trillion predicated on a price assumption of $53/b in 2015 (Ebi & Aladejare, 2022). Be that as it may, other than stabilizing the economy, the issue became worse; thereby raising a question on the fact that this fall in oil prices probably affected both the revenue and government capital budget, the country gradually crave into a contemptuous aura of crisis that evidenced in poor infrastructural facilities, capacity underutilization of local refineries, high poverty and unemployment levels (Anfofum & Olure-Bank, 2018).

3.0   Systematic Review of Literature

3.1   Theoretical Review

3.11   The Dutch Disease Theory (DDT)

Dutch Disease theory was propounded by Corden and Neary in 1983. The Dutch Disease theory originated after the Netherlands found large sources of natural gas and crude oil in the North Sea in the 1960s. As a result of the large capital inflows and revenue, which followed from increasing export revenues, the demand for the Dutch florin increased which in turn resulted in an appreciation of the Dutch exchange rate. This further led to greater difficulty for Dutch manufacturing goods to compete on the international markets. The Dutch Disease theory has remained relevant to this day and is still affecting countries all over the world. With today's increasing world market prices for raw materials we are likely to find other affected countries in the future as well. Dutch Disease theory is now also used to explain negative effects from capital inflow caused for example by aid, remittances, beneficial terms-of-trade shocks or sharp productivity increases in export production. The theory of Dutch Disease by Corden & Neary (1982) states that an inflow of capital, caused for example by an oil boom, causes the real exchange rate to appreciate. The reason for this appreciation is that domestic prices in the tradable and non-tradable sector will be affected asymmetrically with the prices of the non-tradable sector rising at a faster rate. This further implies that the competitiveness of the tradable goods deteriorates in international markets as the opportunity cost of producing tradable goods has increased.

The small open economy is assumed to consist of three sectors in Corden and Neary's model. Tradable goods are produced by the booming and the lagging sectors while the third sector produces non-tradable goods. The booming sector can for example be the oil, gas or mineral industry and the lagging sector the manufacturing industry. The non-tradable sector is usually defined as services. The three sectors use a common factor of production, labour, and a sector specific factor, capital. The most important mechanism behind Dutch Disease is the real exchange rate. The real exchange rate defined above is the main mechanism behind Dutch Disease. The appreciation of the exchange rate gives rise to two different effects in the economy which is called the spending effect and the resource movement effect by the Dutch Disease theory. Oil-induced Dutch Disease assumes an oil sector which largely contributes to the economy.

DDT assume a small open economy that produces three goods: two which are traded at exogenously given international prices, and a third, which is a non-traded good whose price is determined by domestic supply and demand.   The traded goods sector includes a booming good, and a non-booming one. The non-traded good is typically thought to be produced by the service sector (but it can be extended to the construction sector etc). A resource boom affects the rest of the economy in two main ways: the resource movement effect and the spending effect. This factor movement also leads to an increase in the price of non-traded goods since, ex ante, it results it excess demand for non-tradables.   Since the price of tradables is exogenously determined in world markets, the rise in the prices of non-tradables is equivalent to an

appreciation of the real exchange rate. Since the price of tradables is given by world markets, this extra spending raises the relative price of non-tradables, resulting in a further appreciation of the real exchange rate. In response, mobile factors shift from the tradables sector to the non-tradables sector. Here, results a contraction of the non-booming tradables sector results. That is the spending effect.

The core Dutch Disease model, attributed to Corden and Neary (1983), is modelled within the framework of a three-sector economy, namely a non-tradable sector (N), a manufacturing sector (M) and a resource sector (R). The model assumes that: labour is perfectly mobile among all the three sectors and makes sure that wages equalize across them; all goods are for final consumption; trade is always balanced as national output always equals expenditures; and commodity and factor prices are not distorted. Also, the actual exchange rate exhibits a tendency to appreciate as a result of either one or a combination of the following factors: an upsurge in domestic absorption and permanent income; an increase in the price of non-tradable goods; a change in relative prices; and a boost in foreign capital inflows (remittances).

The Dutch Disease theory opined that changes in relative prices between tradables and non-tradables cause changes in the real exchange rate. In other words, sectoral productivity differentials across countries are identified as the fundamental determinant of real exchange rate movements. Economies with a higher level of productivity in tradables will be characterized by higher wages and since international productivity differences are wider in tradables than in non-tradables, also by higher prices of non-tradables. Secondly, changes in the real exchange rate as a consequence of variations in relative prices between exports and imports. In other words, relative price movements within the tradable sector, specifically movements in the relative price of exports, are a major determinant of real exchange rate movements. Thirdly, the importance of fiscal policy changes in determining real exchange movements. A fiscal deficit could produce two sorts of effects. On the one hand, if the fiscal deficit increases (i.e. there is an expansive fiscal policy), interest rates will rise as a consequence of a restrictive monetary policy, and the real exchange rate will appreciate.

According to the Dutch Disease, one of the resource curse concepts, inflow of resource revenues into a country causes appreciation of real exchange rate, undermining the competitiveness of the non-resource sector and leading to higher demand for imports and services. Why inflow of revenues from oil export has not made any significant improvement in budget implementation of Nigeria. Taiwo (2011) discovered the present of Dutch Disease in Nigeria, and recommended that strong institutions are need to provide enabling environment so that fiscal and monetary policy, direct distribution of oil revenue government accountability and transparency could work as all solutions provided to the resource curse. Paulo *et al.* (2017) carried out a study on the resource curse using a Dutch disease and economic complexity analysis for 122 countries from 1963 to 2013. From the study, it was established that oil shares were in excess of 50% of exports in oil exporting countries.

The Dutch disease can be seen as the process by which a boom in a natural resource sector results in shrinking non-resource convertible. This same process increases the specialization of the natural resource sector, thereby, leaving the economy more susceptible to resource specifc shocks. The effect of Dutch disease on the economy was divided by Corden and Neary (1982)

into two effects, specifcally, the resource movement effect and the spending effect. The resource movement effect is the aspect of which the increase in the price of the discovered resource causes the marginal product of value of the resource to increase, which consequently increases wage rate in the newly discovered resource operation, some of which might perhaps shut down. The spending effect on the other hand can be seen as the increase in revenue accounted for by the natural resource discovered.

Heavy dependence on oil and gas revenue have not been the best for the Nigerian economy due to the volatility of oil prices causing the size of public spending to fluctuate. The huge oil windfall has led to pervasive fiscal indiscipline, unethical practices and lack of probity and transparency on the part of the government and the utter neglect of the non-oil sector of the economy.

Despite the huge amount of revenue generated from the oil and gas sector, its impact on aggregate revenue and economic development of Nigeria as regards improved productivity in other sectors and human development remains questionable and debatable. The adequacy and stability of future inflows from oil and gas revenues has increasingly become a big issues because of the intricacies and instability in the oil and gas market. The continued poor performance of the non-oil sector and the influence of extraneous variables and the exogenous sector underscore the imperative of re-evaluating the thrust and contents of the nation development budget, policies and commitments to their diligent execution.

The natural resource (like oil and gas) generate a paradox of plenty when they create dependence and damage other tradable sectors and sources of economic growth and development such as human capital and the real sector -manufacturing and agriculture

A major effect of the oil boom was the open neglect of the non-oil revenue sources (Kim, 2018). The observed neglect may have declined the volume of non -oil tax revenue accruable to government and allowed lapses in tax administration among non-oil taxes. This over concentrated attention on oil revenue as against non-oil revenue could have also encouraged tax evasion among the non-oil tax. Consequent on the global market price fluctuation and the tendencies for technological breakthrough among key customers of Nigerian crude oil which could cause reduction in crude oil patronage on the international market; the non-oil revenue taxes became necessary for re-examination in relation to economic development.

The Nigerian government has made series of efforts over the years to expand the non-oil sector as part of its policy agenda to diversify the nation's economy from oil and gas to the real sector (manufacturing and agriculture). These objectives and policy thrusts have not produced the desired results. The non-oil sector has huge potentials for foreign exchange earnings and can bring about huge employment generation and poverty reduction through the extensive backward linkages it offers. The instability of government revenue resulting from fluctuation in international oil and gas prices gives credence to the argument in favour of diversification of the nation's economy cum revenue base. An evaluation of the trends and developments in the Nigerian non-oil sector reveals that despite the various policies, strategies and reform

programmes of the government, the contributions of the sub-sectors have been abysmal and well below desired expectations.

Uremade et al (2020) argue that the over-reliance on oil revenue has a tendency to mislead and depress sourcing of revenue from other sources by the government. For instance, as a result of enormous oil revenue flows; countries tend to de-emphasize taxes as a source of government revenue.

On the other hand, the proponents of the "resource curse" theory (or "oil needle", or "Dutch disease") consider that high oil prices cause oil-exporting countries to lag in their economic development (Feng et al., 2020). However, the availability of natural resources is not the curse, rather it is their domination in the GDP formation of the country's economy: when the priceof crude oil rises as a resource sector commodity for a long time, under the influence of the factor of wage growth in the oil-industrial complex, labor force outflows from the tradable sector. Additionally, an increase in crude oil prices intensifies foreign investment in the oil industry, which raises the cost of the country's national currency and reduces the competitiveness of domestic producers' goods compared to imports (Ramcharran, 2002). In other words, the resource and non-tradable sectors suppress the development of the tradable goods sector. Consequently, economic growth rates are constantly decreasing, the number of unemployed people is increasing, and, as a result, a recession in social and economic sectors in the country may occur, which will only exacerbate the situation with the environment (Feng et al., 2020)

Nevertheless, there is no convincing systematic evidence of a causal relationship between income from resource exports and the decline in industrial production. It should be noted that it is quite difficult to apply the "Dutch disease" theory to the analysis of the reasons for stagnation in OPEC countries, since most countries, in particular OPEC members, are characterized only by the resource and service sectors. The consequences of the prevailing raw material export economic development model are related to the low level of SDGs achievement by the OPEC member countries, the level of which, except for in Angola, Equatorial Guinea, Libya, and Iran, in 2020, averaged 62% (Ramcharran, 2002).

In this case, it can be said that there has been no progress in this direction over the past 20 years, as the average level of SDGs achievement in OPEC countries compared to 2000 has changed only by 4%, mainly due to the progress of four countries: United Arab Emirates, Algeria, Gabon and Congo (Feng et al., 2020).

3.2   Empirical Review

Fasanya *et al.* (2013) examined the effect of oil discovery on sectoral performance in Nigeria, from the time period of 1975 - 2010. The study employed Vector Error Correction Mechanism (VECM). The VECM confirmed that oil discovery in Nigeria affects both the agricultural and industrial sectors expenditure. Therefore, concluded that the existence of DDT in Nigeria and recommended that government should give priority to the agricultural sector in budget implementation. According to Michaelto Michael (2013), increase in oil sector output in Nigeria caused impediment to growth in other sectors as a result of easy money, lack of

good policies from government could have removed these obstacles and produced a more balanced pattern of growth. The continuous increase in this phenomena lead to exchange rate appreciation and total expenditure of government (spending effect); therefore, leads to movement of labour from manufacturing sector to booming sector (natural resource). A situation known as resource movement effect.

Riti et al (2016), examined the effects of non-oil sectors on the economic performance and diversification of Nigeria. The study employed ex post and correlational research designs. The data for the study was collected from the Central Bank of Nigeria. The study used the gross domestic product as a measure of economic performance and as the dependent variable. The independent variables in the study consisted of the agriculture sector; manufacturing sector and telecommunication sector were used as proxies forgone-oil sector. The study used autoregressive distributed lag model (ARDL) and vector error correction mechanism (VECM) methods as tools for analyzing the data collected. The findings of the study revealed that the agriculture sector and telecommunication sector exerted a positive and significant impact on Nigerian economic performance. The study also showed that the manufacturing sector exerted a negative and significant impact on Nigerian economic performance.

Asangunla and Agbede (2018) investigated oil revenue and output growth in Nigeria for the period 1981 to 2014. The study used ex post facto and correlational research designs. The study used secondary data obtained from the Central Bank of Nigeria for the period under review. The study employed Beghebo and Atima model with little modification with a fully modified ordinary least squared method (FMOLS) for the purpose of data analysis. The data analysis indicated that oil revenue does not have a short-run influence on the economic activities of Nigeria. However, the long-run influence of this policy provided an authentic level, as it was discovered that the continued increase in oil revenue will eventually provide future economic growth for Nigeria. The study though suggested that the government should efficiently and resourcefully use the oil revenue into strategic progressive ventures so as to decrease the rate of insufficiency and assist output growth.

Manasseh et al. (2019) Using annual time series data which covers the period 1981–2014 and multiple regression techniques, investigated the impact of oil price fluctuation and oil revenue on well-being in Nigeria. The findings suggest that oil price fluctuations have no significant impact on well-being, while oil revenue is observed to have a significant and positive impact on well-being. Notwithstanding the insignificant impact of oil price fluctuation, further investigation using Johanson cointegration test shows the existence of long run relationship in the series. This implies that, as oil prices increases/decreases, so does well-being of the people. In like manner, we also found that, as the oil revenue increases/decreases, so does the well-being of the people. In view of the findings, we suggest that government should save more at the time oil boom -that is when oil price rises above its benchmark. Furthermore, we are of the opinion that the control and management of the excess crude account should be solely delegated to Central Bank of Nigeria with no form of interference.

Al-Rasasi et al (2019) investigated oil revenues and economic growth in Saudi Arabia for the period 1970 to 2017. The study employed ex post facto and correlational research designs. The

data for the study was collected from the GASTAT and the Ministry of Finance of Saudi Arabia. The data collected was analysed using stationary, cointegration, error correction model and causality tests. The error-correction model analysis indicated a highly significant short-and long-run relationship between oil revenue and economic growth. The ganger causality test that was performed disclosed that real government oil revenue growth "Granger-causing" real private-sector GDP growth.

Olawunmi et al. (2018) conducted a study of the relationship between oil price, revenue and changes and economic growth of Nigeria. The study employed data from 1981 to 2016. The method of estimation used was the Auto-regressive Distribution Lag to create the presence of a long-run and short-run relationship between the variables used in the study. In the long run assessment, oil price, the consumer price index and the exchange rate ensured a positive relationship with economic growth, but oil revenue was negatively associated with economic growth. However, in the short run, the consumer price index and exchange rate are negatively related to economic growth. On the contrary, oil price and oil revenue displayed a significant positive association with economic growth in the short run.

Jabir et al. (2020) carried out a study of oil revenue on economic growth in 83 oil-producing countries from 1990 to 2015. The study employed ex post and correlational research designs. The study utilized the financial markets development mechanism and discovered that government investment of oil revenues exerted a positive impact on economic growth through banking sector development. There was no effect found on stock market development. The study further recognized that the private investment of oil revenues indicated a negative influence on banking sector development did not have any effect on stock market development.

3.3   Gap Identification

Crude oil is among the most important commodities in the world as it is not only an energy product but also a financial asset. Thus, oil price fluctuations have a substantial effect on the global economy and financial markets. This study examines factors affecting oil price volatility in a time-varying manner, focusing on WTI crude oil. Oil price volatility reflects information from both physical and futures markets of oil (Chatziantoniou et al., 2021). Energy traders find such information potentially useful for their asset portfolio management and hedging strategy (Chatziantoniou et al., 2021). Therefore, modeling and forecasting the oil price volatility has become a major issue in financial research (Ma et al., 2019). Indeed, the volatility of crude oil returns has recently received more attention from academics, practitioners, and market regulators, as evidenced by the growing literature in this field.

Some earlier studies had been carried out on the relationship between oil revenue and economic growth in Nigeria. For example, Eze et al (2018), Yahaya and Yusuf (2019), Akinlolu and Nejo, (2020), Efanga et al, (2020), Uremade et al (2020), Pan et al. (2017). While some of these previous studies found a positive relationship between oil sector revenue and economic growth (Efanga et al, 2020), others found a negative relationship between oil sector revenue and economic growth (Akinlolu & Nejo, 2020). In terms of the degree of influence, some of the studies (Efanga et al, 2020) found oil sector revenue to have exerted a significant impact on

economic growth while others found that oil sector revenue had no significant effect on economic growth (Asagunla & Agbede, 2018; Olayungbo & Kazeem, 2017). Equally, in some previous studies, oil industry constituents were inadequate to largely the sale of crude oil were carried out on whether revenues from the sale of crude oil impacted economic growth.

Several studies analyzed the impacts of oil price fluctuations on various aspects of the economy, including productivity, economic growth, investment, trade, financial market, economic policies, and institutions (e.g., Apergis, 2019; Vo & Le, 2021). Over the past few decades, the literature explored the linkages between oil price volatility and economic activity. The empirical evidence suggests the negative influence of higher oil price volatility on economic output, investment, and consumption (Chen et al., 2019), economic growth (Wang and Sun, 2017), inflation (Demirbas et al., 2017). Demirbas et al. (2017) documented non-linear relationships among oil prices, interest rates, and inflation rates. In addition, oil price volatility is found to have effects on the volatility of other commodities such as metal and agricultural products (Vu, 2019; Ezeaku et al. 2019). The transmission mechanism of the impact of oil price volatility on the economy includes fiscal channels, especially public expenditure (Ally, 2016). Oil price volatility poses seriously challenges to macroeconomic stabilization policies (Chen et al., 2019) since it adversely affects the efficiency of government spending (Lyu et al., 2021)). In general, oil price volatility is associated with economic uncertainty, which influences the decision-making of economic agents (Ugwo et al., 2019). Hence, it is important for economic agents to understand the multi-dimensional effects of oil price volatility (Apergis, 2019).

4.0   Model Specification

This study proposed the evaluation of the effect of oil price volatility on oil revenue and economic performance;

Oil price volatility is segregated into fluctuation on Brent Oil, West Texas Intermediate, OPEC Basket Reference Crude Oils and Dubai Oil.

$$OREV=f(BO,WTI,OPEC,DO)\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(1)$$
$$EPER=f(BO,WTI,OPEC,DO)\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(2)$$

The proposed model is adapted from work of Kisswani (2021).
$$EPER=\beta_0+\beta_1BO+\beta_2WTI+\beta_3OPEC+\beta_4DO + \varepsilon \dots\dots\dots\dots\dots\dots(3)$$

Where; OREV represents Oil Revenue (Proxy for Economic Performance (EPER)) (Dependent variable); BO represents Brent Oil Price Volatility (Independent variable); OPEC represents OPEC Oil Price Volatility (Independent variable); WTI represents West Texas Intermediate Oil Price Volatility (Independent variable); DO represents Dubai Oil Volatility (Independent variable); $\beta_0, \beta_1, \beta_2, \beta_3,$ and β_4 are regression coefficients to be estimated and ε is rrror term.

A-priori Expectation

$\frac{dBO}{dEPER} < 0$:connote that Brent oil price volatility is expected to exert negative or positive effect on oil revenue (economic performance).

$\frac{dOPEC}{dEPER} < 0$: connote that OPEC oil price volatility is expected to exert negative or positive effect on oil revenue (economic performance).

$\frac{dWTI}{dEPER} < 0$: connote that West Texas Intermediate oil price volatility is expected to exert negative or positive effect on oil revenue (economic performance).

$\frac{dDO}{dEPER} < 0$: connote that Dubai Oil price volatility is negative to exert positive effect on oil revenue (economic performance).

Framework Development
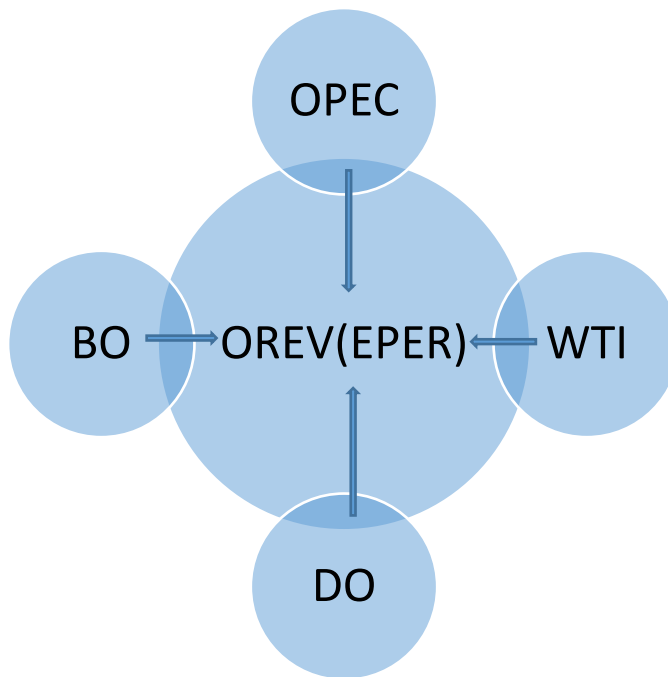
Source: Author's conceptualisation 2023

5.0   Conclusion and Recommendation

The purpose of this paper is to give a general understanding of the global crude oil price, oil revenue and economic performance vis-à-vis Dutch disease proposition. This work explores the relationship between the price of crude oil and its oil revenue generation on the regions of the

Organization of the Petroleum Exporting Countries (OPEC) and non-Organization of the Petroleum Exporting Countries (non-OPEC). The crude oil price has recently been fluctuating greatly that it cannot be predicted; this fluctuation causes changes in the oil revenues, thus affecting the economy worldwide. To better understand the factors that affect the crude oil price, this study examined West Texas Intermediate (WTI), Brent, Dubai oil and OPEC oil prices whether the Global oil fluctuation in these countries have a significant effect on the fluctuation of Oil revenues.

Various studies have confirmed the importance of crude oil prices to the global economy. This study focuses on the relationship between crude oil prices and oil revenue levels. However, therefore, in addition to the in-depth understanding of the relationship between oil prices and oil revenues, the relationship other variables and oil prices is valuable and worthwhile topic to explore. The findings of the studies reviewed revealed that the agriculture sector, manufacturing and telecommunication sector exerted a positive and significant impact on Nigerian economic performance and diversification dwindling oil revenue should be invested heavily on productive non-tradeable sector according to Dutch diseases hypothesis (Riti et al., 2016).

Most studies recommended that crude oil and its natural components should be utilized for the development of the country. It was vital for the government to improve oil exploration and guarantee that the actions of militants and oil facilities criminals are minimized to the barest minimum if not completely eliminated so as to increase oil production in Nigeria and in turn assist the improvement of economic growth in Nigeria. Studies suggested that the government should efficiently and resourcefully use the oil revenue into strategic progressive ventures so as to decrease the rate of insufficiency and assist output growth.

They showed that non-oil export revenue affects gross domestic product while gross domestic product also affects non-oil export revenue in petroleum exporting countries. The study also discovered that there was a unidirectional association between oil export revenue and gross domestic product. The results further showed that oil export revenue influences the growth of gross domestic product and not otherwise in line with (Ugwo et al., 2019).

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