PETROLEUM SECTOR AND ECONOMIC GROWTH IN NIGERIA: ECONOMETRIC ANALYSIS

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ABSTRACT

The partitioning of the economy into activity sectors has proved a good strategy toward the drive for output growth. Rostow mentioned it in his stages of economic growth theory and it is also a component of the propositions of the unbalanced growth theory of economic growth. The petroleum sector is a key activity sector in the Nigerian economy with growth impacts spanning over pre and post independence Nigeria and accounting for a huge percentage of government revenue and foreign exchange earnings. There has been growing call for the diversion of attention away from the petroleum sector. This study is a research into the impact of the petroleum sector on economic growth in Nigeria from 1980-2014. Up-to-date econometric techniques were employed in the analysis, using the variables: gross domestic product, petroleum refining output, petroleum exports, and agricultural sector output. The result of the cointegration test indicates a longrun relationship between gross domestic product, the petroleum sector and agricultural sector variables, while the granger causality test indicates a one-way relationship between gross domestic product and petroleum refining output. The empirical result indicates a positive and significant impact of the petroleum sector on economic growth in Nigeria. The policy recommendations following the data test results are: Immediate conclusions and passage of the petroleum industry bill to reposition the petroleum sector as a strategic sector to fully harness its potentials in leading the growth of other sectors and of the economy at large, and building of at least 3 more refineries to increase petroleum refining output which has a causal relationship with growth of economic activities.

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INTRODUCTION

Output growth is a major economic objective of nations, since it proves a strategic lee way to development. Achieving this involves tactical manipulation of macroeconomic variables which may include "sectorization" of the economy to allow for optimal, effective and efficient harnessing of resource capacities. Denburg and Duncan (1988) notes that "for some purposes, it would be useful to sector the economy" either based on geography or industry.

Before 1956, agriculture was the mainstay of pre-independence Nigerian economy accounting for a large proportion of foreign exchange earnings and revenue base. This was put paid to by the first discovery in commercial quantities of petroleum in 1956 following the exploration activities of Shell D'Arcy now Shell Petroleum Development Company (SPDC) who at the time was the sole concessionaire. From November 1938, almost the entire country was covered by the concession granted to the company to explore petroleum resources (PENGASSAN, 2015). Shell controlled and maintained a monopoly status until Nigeria enlisted in the Organization of Petroleum Exporting Countries (OPEC) in 1971.

Initially, government interest in the Petroleum Sector was limited to the collection of royalties, lease rentals and taxes. This was reversed following the 1962 Resolution of the United Nations on permanent sovereignty of nations on natural resources (UN, 1962). Thus, in order to assume firmer control of petroleum resources, the government began to enact regulatory and control legislations beginning with the Petroleum Act of 1969. Within OPEC member countries, National Oil Companies (NOCs) began to sprout in attempt to consolidate efforts in watching over the stake of their countries in petroleum exploitation. These NOCs were in direct control of production operations except in Nigeria where International Oil Companies (IOCs) were allowed to continue with operations based on joint venture and participation agreements. The arrival of other IOCs such as Chevron, Total, Exxon Mobil, Agip, etc divested Shell of its monopoly status and gradually the petroleum sector was birthed.

Nigeria has deposits of crude petroleum and natural gas spread across strategic river basins including the Niger Delta, Chad Basin, and the Anambra basin on which prospecting efforts has led to the discovery of petroleum in Anambra by Orient Petroleum whose facilities were commissioned in 2013. Being the leading oil producer in Africa, Nigeria also sits well among the top 9 leading world producers. As at the end of 2011, Nigeria is estimated to have

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a proven oil reserve of 37.2billion barrels and a proven natural gas reserve of 180trillion cubic feet (tcf) (U.S. EIA 2012).

The petroleum sector has come to be the fabric of post-independence Nigeria economy consequently resulting in the near total departure from agriculture since the 1970s. It accounts for over 80% of foreign exchange earnings and more than 75% of federally collected revenue. Between 1981 and 1998 pre-democratic Nigeria, the percentage contribution of the sector to total output (GDP) averaged 26.12% and after the transition to democratic governance, it moderated at 35.90% average between 1999 and 2007 (CBN Statistical Bulletin, 2013).

Oil and gas accounted for 17.35% of GDP in 2008 and 16.29% in 2009 (NBS, 2009) and, a disaggregation of 2009 GDP reveals that Oil composition of GDP was N7.3 trillion, a downward slide from N9.1 trillion in 2008. In 2009, crude petroleum was the major component of Nigeria's export merchandise to the tune of about 85%, lesser than 92% in 2008. In addition to growth and revenue drive, the petroleum sector is also the bone of the power sector and it other dependent sectors; for without light, heat and power we cannot build or run factories and cities that provide jobs, income, goods and services and homes.

One of the goals of economic analyses is solving out puzzles especially those posed by the deviations of expectation from actual. Authoritative sources have attested to the huge contribution of the petroleum sector to foreign exchange earnings and revenue to government, there is therefore, the expectation that the contribution of the petroleum sector to total output (GDP) should have a towering figure. Actual have been far below expectations such that the sector and its relevant stakeholders have developed a form of "adaptive expectation" where actual differ constantly from expectations or sometimes actual oscillate around a stable mean (Black, 2002).

Over reliance in the petroleum sector for revenue has made the economy vulnerable to external shocks due to instability in international oil prices, an attestation to this is the recent incidence of the inability of both federal and state governments to pay workers salaries and meet other obligatory capital and re-current expenditure due to a sharp fall in oil revenue. Again, despite Nigeria's crude petroleum and natural gas reserve status and 445,000 barrels per day total installed capacity of refineries, over 70% of domestic consumption of refined products are imported. The cost of this ran close to $62 billion in 2014 higher than total receipts from crude oil exports in the same year. The potential threat to revenue posed by oil price volatility has led to growing calls for the diversification of the economy. The editor of

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Naij.com, an online news platform notes that "A situation where about 90% of the country's revenue comes from the oil sector portends great danger for the economy."

Furthermore, Nigeria seems to be experiencing the Dutch disease (the resource-curse hypothesis). This term "resource curse" was first used by Richard Auty in 1993 to describe how countries rich in natural resources are unable to use that wealth to boost their economies. Neglect or delay in economic diversification by government owing to the temporary high profitability of the natural resource petroleum, less competitiveness of tradable sectors, volatility of the prices of natural resources to wide fluctuations (the case of petroleum resources), attraction of best talents away from other sectors depriving them of skilled personnel, conflict and fighting for a share of the revenue etc, are the effects of the resource course hypothesis which as a consequence, hampers economic growth. The scenario painted by this hypothesis relates to Nigeria in many respects. The basic goalof economic research is to proffer solutions to observed problems, to attempt to solve this puzzle therefore, we developed research questions that will properly direct and focus attention on the topic and our broad objective is to determine the impact of the petroleum sector on economic growth in Nigeria.

A study of the impact of the petroleum sector on economic growth in Nigeria has economic wide implications and importance. This study is significant in that; clearly establishing the level of impact which the petroleum sector exerts on output growth in Nigeria, and with the knowledge of the existence or not of causal relationship between the petroleum sector and economic growth of Nigeria, provides a clear-cut direction for government and policymakers in the formulation and implementation of growth policies as well as properly direct attention and focus in business and investment decisions. In addition, the research result will form an early warning mechanism to policy makers on the Dutch disease with a view to providing a framework for diversifying growth sources for the economy as well as aid the re-assessment of the petroleum industry bill and the expectations thereof.

The major limiting difficulty encountered in the course of this work is sourcing of data of the representative variables and inconsistencies in data from sources. In spite of data inconsistencies observed, efforts were made to ensure the reliability of the data, as all the data were collected from a reliable agency which is the Central Bank of Nigeria (CBN). Any other errors of commission or omission are precisely those of the researcher.

LITERATURE REVIEW

Theoretical Review

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Economic growth may be defined in terms of the total physical output, or real income, of an economy, or to be more precise about it, economic growth refers to increases in real per capita output of an economy (Udabah, 1999). The precinct of this view is that growth basically concerns the appreciation in the sign and size of output overtime.

Lipsey and Crystal (2007) see economic growth as "a gradual but continual rise in potential GDP'. To take in the market factor, Ugwuanyi (2004) defined gross domestic product as the value of all final goods and services produced in an economy in a fiscal year valued at market prices plus the imputed value of the economy's produced goods and services that do not pass through the market channel minus net income from abroad. Ugwuanyi's notion is apt as it captures the fact that there are informal sectors in the economy. Informal sector here means the aggregate unregistered but active businesses. The definition also describes what items constitute the gross domestic product. Gross domestic product is the total final output of goods and services produced by the country's economy, within the country's territory, by residents and non residents, regardless of its allocation between domestic and foreign claims (Todaro and Smith, 2011). The gross domestic product practically aggregates all outputs in an economy and basically indicates the productive capacity of an economy in a time period usually a year and given a market valuation.

The American Heritage Science dictionary (2002) describes petroleum as a thick, inflammable yellow-to-black mixture of gaseous, liquid and solid hydrocarbons that occur naturally beneath the earth's surface, can be separated into fractions including natural gas, Gasoline, Naphtha, Kerosene, Fuel and lubricating oils, paraffin wax and asphalt and is used as raw material for a wide variety of derivative products. The hydrocarbons in crude petroleum can generally be divided into Paraffin, Naphthenic, Aromatics and Asphaltic. In our Nigerian clime, petroleum is unconventionally described as "liquid gold". Just as gold has almost no value until it has been purified, so does petroleum until it is refined into its derivative products. Petroleum has a variety of uses but the primary use is in the production of fuel.

Concerted efforts are made by nations the world-over towards achieving growth as a macroeconomic objective. This underscores the role of economic growth in the development process. Most studies on economic growth feature the decomposition of overall output activity into sectors. The 18th century Physiocratic analysis of the production and distribution of agricultural output formalized the belief that economic growth depends on the expansion of a key sector and the underlying view has been that all sectors are not equally important for

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economic growth.Stafford (1981) observed that there is an economic relationship between overall growth performance and the performance of one sector.

Stages of Growth Theory

Theories exist on the relationship between sectoral development in an economy and economic growth. Rowstow in his "Stages of economic growth" theory discussed how the development of strategic sectors in an economy can spur growth and he described this in the take-off stage. Jinghan (2011) describes this stage as "when growth becomes its normal condition". As prescribed by Rostow, one of the conditions for the take-off is the development of leading sectors in the economy and regards this as the analytical bone structure of the stages of economic growth.

Unbalanced Growth Theory

The theory of unbalanced growth popularized by Hirschman posits that a deliberate unbalancing of the economy according to a pre-designed strategy is the best way to achieve economic growth in an underdeveloped nation (Jhingan 2011). This deliberate unbalancing of the economy means heavy investment into a strategic sector of the economy and not all the sectors taken simultaneously. The assumption is that this strategic sector when fully developed catalyses the growth of other sectors and the aggregate national output. For him, investment in strategically selected industries or sectors of the economy will lead to new investment opportunities and so pave way for further economic development, and probably in concurrence with this Jinghan (2011) states thus "growth is being communicated from leading sectors of the economy to the followers, from industry to another, from one firm to another". Rostows favors unbalanced growth and explains it in terms of leading sectors in an economy.

Structural Change Theory

The structural change models of economic growth analyses the relationship between industrialization and economic growth. The theory formulates the hypothesis that underdevelopment is due to underutilization of resources arising from structural and institutional factors that have their origin in both domestic and international dualism. The theory advocates for structural transformations described in Todaro and Smith (2011) as "the process of transforming an economy in such a way that the contribution to national income by the manufacturing sector eventually surpasses the contribution by the Agricultural sector.

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The description given by Jhingan (2011) is that "industrialization plays a major role in the economic development of LDCs. It is a pre-requisite for economic development as the history of advanced countries show. For development to occur the share of the industrial sector should rise and that of the agricultural sector decline". He went ahead to state that "this is only possible through a policy of deliberate industrialization".

The critical appraisal of the role of industrialization in economic growth and development presented by Jhingan suggests that "the policy of industrialization followed by LDCs in the early phase of their development has not brought the expected economic and social benefits. The reasons he adduce are that it has failed to reduce inequalities of income and wealth, unemployment and regional imbalances and the pace of development has been uneven with the neglect of the growth of other sectors. In addition, he notes that " industrialization has created such serious problems as rural stagnation, the mushrooming growth of the urban class, organizational power failures in government bureaucracies and the excessive high rate of population growth and the labour force, among others.

According to Jhingan (2011), P. C. Mahalanobis developed a single sector model in 1952 based on the variable of national income (GDP) and investment sector. This model was further developed into a two-sector model in 1953 where the entire output of the Indian economy was supposed to be produced in only two sectors. H. Uzawa in Jhingan (2011) also developed a model that is based on the consumption and investment demand, where the economy is made up of two sectors which were taken to be, the investment sector and the consumption sector.

In Wilson (2002) one of the determinants of economic growth is identified as structural changes that take some complementary forms, beginning with the expansion of the non agricultural sector in such a way that labour is shifted from primary to tertiary sector. This transfer of employment according to Wilson will occur when there is improvement in transport, retail and wholesale distribution, education, government and domestic services.

These whole events forms the movement towards manufacturing which will eventually increase the number of available produced goods and services to satisfy domestic consumption needs and substantial amounts for export. Export drive is one of the strategies for achieving growth forming part of the outcomes of structural changes. All efforts towards export are always deliberately put forward by government because it requires planning. Therefore, petroleum exports variable fits well into the model to be evaluated in this study.

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The export drive usually requires government to initiate policies that stimulate and encourage the production of goods and services for export purposes.

The theory of unbalanced growth has faced a number of criticisms especially as outline in Jhingan (2011) as; inadequate attention of the theory to the composition, direction and timing of the unbalanced growth; lack of basic facilities as there may be a lot of difficulties in procuring personnel, finding adequate domestic and foreign market for the products; and the fact that the linkage effect is not based on data pertaining to an underdeveloped country where social overhead facilities are not fully developed. These and many other limitations of this theory may be traced to why the call for the diversification of the economy away from the petroleum sector has persisted.

Activities in the Nigerian Petroleum Sector

A number of industry players, stake and shareholders exist in the petroleum sector including the Ministry of Petroleum Resources in representation of government, acting through the Nigerian National Petroleum Corporation (NNPC), the Department of Petroleum Resources (DPR) and the Pipelines Product Pricing and Regulatory Agency (PPPRA); others are the International Oil Companies (IOCs) such as Shell, Exxon Mobil, Agip, Chevron, Total etc. engaged in both upstream and downstream operations. The sector is categorized into five divisions based on functions performed:

- **The Upstream Division:** engaged in the exploration and development of crude oil. It is particularly in this division that SPDC majors.
- **The Downstream Division:** includes tankers, refineries and final consumers. There are four refineries in Nigeria located at Port Harcourt, Warri and Kaduna with different installed refining capacities.
- **The Pipelines Division:** engages in any hazardous pipeline including petroleum, liquid CO_2 etc. The Petroleum Product Pricing and Regulatory Agency (PPPRA) functions here.
- **The Marine Division:** concerned with the transportation of petroleum by water, this underscores the awarding of the surveillance contract by Nigerian Maritime Safety Agency (NIMASA) to checkmate the activities of oil pipeline vandals operating through the seas.
- **The General Services and Supply division:** including equipment manufacturers, consulting firms etc.

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There are also a number of labor unions whose activities influence policies in the sector. These include: the National Union of Petroleum and Natural Gas (NUPENG), Petroleum and Natural Gas Senior Staff Association of Nigeria (PENGASSAN), Petroleum Tanker Drivers (PTD), Independent Petroleum Marketers Association of Nigeria (IPMAN) etc.

Regulations and Guiding Laws in the Sector

Having considered the strategic nature of the sector in the economy, government periodically develops control and regulatory mechanisms to strengthen its influence on the sector through the Department of Petroleum Resources (DPR) and other Agencies. The DPR has the statutory responsibility of ensuring compliance with petroleum laws, regulations and guidelines by all players in the sector. The statutory functions of the Agency as spelt out in the agency's website include:

- Supervising all petroleum industry operations being carried out under licenses and leases in the country.

- Monitoring the petroleum industry operations to ensure that they are in line with national goals and aspirations including those relating to flare down and domestic gas supply obligations.

- Ensuring that health, safety and environment regulations conform to national and international oil field best practice.

- Maintaining records on petroleum industry operation, especially on matters relating to petroleum reserves, production/exports, licenses and leases.

- Advising government and relevant government agencies on technical matters and public policies that may have impact on the administration and petroleum activities.

- Processing industry applications for leases, licenses and permits.

- Ensure timely and accurate payments of rents, royalties, and other revenues due to government.

- Maintain and administer the National Data Repository (NDR).

Regulation in the petroleum sector is backed by a number of legislative Acts including: Petroleum Profit Tax Act of 1959 as amended , The Petroleum Decree of 1969 as amended, Petroleum Refining Regulation Decree of 1969, Offshore Revenue Act of 1971, the Land Use Act of 1976 as amended, Oil Pipelines Act of 1978 as amended, Exclusive Economic Zone Act of 1978, Oil in Navigable Waters Act of 1979, Associated Gas Re-injection act of 1979, The Petroleum Equalization Fund Act of 1989, Nigeria Liquefied

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Natural Gas Act of 1990, and the pending Petroleum Industry Bill 2012 (PIB) of various versions which has been subjected to series of modifications probably to capture vested interests since the first version developed in 2008.

These Acts and their regulations form the primary regulatory laws guiding operations and activities in the petroleum sector. The latest version of the Petroleum Industry Bill (2012) embodies Nigeria's anticipated roadmap to attaining optimal operations and returns, local content promotion intended to vest the petroleum wealth of Nigeria on Nigerians, and a framework for effectiveness, efficiency, safety, health and environmental protection among others. Otiotio (2013) observes that "As promising as it seems, its passage has been stalled as a result of opposition from IOCs". The delay in the passage of the bill has further stalled potential investments into the sector as the IOCs are speculating its outcome. Passage of the PIB will among other things revamp the petroleum sector into an enviable economic strata of the economy, promote and increase the participation of Nigerians as major players in the sector and drive the local content initiatives to spur growth and development.

Challenges Facing the Petroleum Sector in Nigeria

Challenges are short-run limitations which come with opportunities that can be exploited to fight away threats posed to growth. Like other developing economies characterized by sectoral inadequacies, the petroleum sector in Nigeria has a lot of hurdles to overcome. Among the numerous challenges facing the sector, the most critical are highlighted below.

- **The Dutch Disease:** Nigeria's abundance is yet to be transformed into sufficiency as it appears that petroleum in Nigeria is becoming more of a curse in many respects. The held economic expectation is that natural resources are important determinants of national wealth and should be used to boost the economy. But the case in Nigeria paints squandered or missed opportunities resulting from inefficient and wasteful activities and sometimes, even where technical efficiency is achieved, net benefits are squandered. These constitute inhibitions on growth and stagnates the economy that is heavily dependent on the sector.

- **Gas Flaring**: A large percentage of Nigeria's gas derivate from petroleum and natural gas is been flared. Nigeria has the capacity to generate as much revenue from gas as it does from petroleum. The petroleum sector cannot yet be described as an integrated oil and gas sector because the opportunities from gas have not been converted. Gas is needed to power refineries and petrochemical plants, generate electricity for both

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industrial and domestic consumption and other chain needs. This implies a wide and long demand situation capable of adequately complementing if not overtaking the revenue status of petroleum.

Flare is predominantly due to the absence of or shortage of facilities and infrastructures needed to increase production as well as the absence of a gas pricing that should provide a satisfactory return on investment.

- **Inadequate Local Content and Deficit in Human Capital**: Nigeria's Petroleum Sector did not develop with National oil companies like its counterparts in OPEC. The international oil companies held sway in Nigeria's petroleum sector for a long time until recently, when the need for local content dawned on the economy. This long time grip on the sector by IOCs is the very reason we have human capital deficit in the petroleum sector. This could mean that the objectives of the Petroleum Technology Development Fund (PTDF) are yet to be met. Efforts are still low in developing Nigerian experts, technicians and specialists in Petroleum Engineering and Petroleum Economics to boost local content and a sufficient human capital base for the sector.

- **Crude Oil Theft and Pipeline Vandalism**: Nigerian loses an estimated 150,000 barrels of crude oil per day to pipeline vandals. In 2013 alone, 327,480 metric tons of petroleum products were lost to the activities of vandals while a whooping 2.312million barrels of crude oil were stolen (NNPC,2013). The implication of these on the economy are loss of revenue, low supplies and fluctuating output, rise in local price of petroleum products and as a consequence, hardship on the people. This is a serious challenge facing the petroleum sector and efforts at curtailing it are yet to yield meaningful results.

- **IOCs/NOCs – Host Communities Conflict**: In an atmosphere of conflict, no meaningful growth or development is possible. The inhabitants of any environment solely rely on its resources for both economic and social sustenance. Both the upstream and downstream activities of the sector especially those of the IOCs have left the environment polluted and degraded, biodiversity depleted, health hazard and low life expectancy with negative social and economic consequences such as loss of livelihood, urban congestion due to rural-urban migration, socio-cultural adjustment problems etc.

- **Facility and Infrastructural Deficit**: Increase in the productivity and output of the petroleum sector requires huge investment on facilities and infrastructures such as

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refineries, storage tanks, cargo ships, transportation etc. deficiency in these is the major reason why Nigeria dwells more on exporting crude and importing refined products for local consumption demand – this is gross mal-economic action. The sector can only achieve efficiency and effectiveness in capacity utilization by refining and exporting refined products than unrefined crude petroleum. At present, Nigeria lacks sufficient refining facilities and gas development infrastructures to meet this target.

Contribution of the Petroleum Sector to Nigeria's Economy

The petroleum sector has remained the very fabric of the Nigerian economy with diverse impact areas including physical and human development as well as social transformations. The sector is very dear to Nigeria as a nation since it provides the national means of sustenance. Some of the contributions of the sector to the economy are discussed below:

- **Employment Generation**: As an economic goal of government, employment generation involves the creation of jobs and opportunities for people to gain employment earn income and secure means of sustenance. The petroleum sector generates a good number of jobs and can be next only to the agricultural sector which has been the traditional employer of labour. One important feature of jobs in the petroleum sector is the above average sustainable and stable income.

  Investments into the sector has kept job openings flowing and people are employed, to the effect that oil and gas jobs has become hot cake and the sector itself, a most-preferred job destination.

- **Power, Water and Energy Solution**: The petroleum sector has contributed to the development of the power sector, water and energy. The power sector depends much on gas supply for power generation and transmission. Outside of this, the industry players especially the international oil companies (IOCS) through their corporate social responsibility under take electricity generation and distribution to its host communities.

  Industrial and domestic energy requirement are also satisfied by the petroleum sector through the supply of associated industrial and domestic gas. Water solutions are also provided by industry players who make financial contribution to water development.

- **Revenue Generation:** It is an obvious fact that the petroleum sector is next to none in revenue generation to government. The sector has remained the main revenue source providing about 76% of federally collected revenue annually. The recurring

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circumstance where federal and state governments are no longer able to meet basic public needs as a result of the continued slump in global oil price is an attestation to the revenue generating status of the petroleum sector,

- **Industrial Growth:** Industrial growth and development requires energy and power to thrive. The petroleum sector has been behind the promotion of industry through the provision of power and energy with which industries run their factories and undertake production. The development of the automobile policy was trusted on the improvement in power and energy driven by the petroleum sector. the industrial and manufacturing sector has witnessed tremendous transformation as a result of synergy with the petroleum sector.

- **Foreign Investment Flow:** Outside of internally generated revenue, foreign direct investment is also needed in driving growth. For the most part of 2012 to 2014, Nigeria was the investment hub of Africa and a huge fraction of foreign direct investment into Nigeria flowed to the petroleum sector. In 2012, about $3 billion dollars in foreign direct investment flowed into Nigeria through the petroleum sector.

- **Human Resource Development:** Increased activities in the petroleum sector have led to the creation of human resource development initiatives to meet industry demand. These initiatives come in form of scholarship opportunities and overseas training in a bid to develop personnel and management. There are also skill acquisition training initiatives in engineering and technical works provided by industry players in the sector. Developments in both on shore and off shore petroleum has provided opportunity for the local content development allowing Nigerians to gain necessary expertise

- **Foreign Exchange Generation:** The petroleum sector has continued to fill the vacuum in foreign exchange created by shortages in agricultural production and manufacturing. Petroleum export has remained the highest merchandise export trade of Nigeria up to present. The combined impact of global oil prices and disturbances in the oil rich Niger Delta has implication on the naira where other commodity exports are not sufficient enough to stabilized exchange rate. The petroleum sector is responsible for almost 90% of Nigeria's annually generated foreign exchange.

- **Transportation:** Transportation activities are disaggregated into road, rail pipeline, air and water. Petroleum is transported through water, pipelines and road and development in these areas of the transport sector come about in a bid to provide infrastructure needed to ensure free flow of traffic in the movement of petroleum and

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association products. This in effect leads to increase in gross domestic product. In terms of contribution to GOP growth, transportation activities accounted for 2.71% in 2008 and 2.70%2009 respectively.

- **Community Development:** The presence of oil companies and associated government agencies concerned with oil and gas, has continued to impact on the development of local communities especially host areas. Most community development projects are initiated and financed by these industry players. This intervention has relieved government of unmet public demand and needs. The intervention actions take the form of scholarship offers to the children of the host communities, skill acquisition and vocational training, water and road projects and other socio-economic palliatives.

In all, the petroleum sector has impacted on virtually all fabrics of the Nigeria economy being the main driver of output growth. Despite these, it still appears that there is a question mark on the contribution of the sector to growth as expectations have been lowered based on observed performance outcome. This therefore supports the relevance of this study.

Empirical Review

In order to validate any research work, it must streamline with related works of other scholars. This helps to establish comparative facts, show the background of the research topic and reveals the gap in literature. Related works have been done in this area; different methods were employed which produced different results.

Ogbonna and Appah (2012) did a research work on "Petroleum Profit Tax and Economic Growth in Nigeria (1970-2010). The co integration analysis method was employed and the result showed a long run equilibrium relationship between petroleum profit tax and economic growth". The work is weak on the basis that petroleum profit tax alone is not a true representation of the total output of the petroleum sector as it does not consider that state owned oil outfits are involved in other revenue generating petroleum industry activities like production, exports, refining and sale of petroleum and petroleum products.

Abdulhamid (2011), research on "The Impact of Oil Export on Economic Growth in Nigeria (1970-2006)", the OLS econometric method was used in regressing labour, capital, domestic consumption of crude oil, crude oil export and total production of crude oil on real gross domestic product. The result showed that domestic consumption of crude oil, capital and crude oil export had positive relationship with real gross domestic product.

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Salami, Kari, Alam, Chukwu and David (2012), researched on "Foreign Direct Investment into the Oil Sector and Economic Growth in Nigeria", where labour, capital, foreign direct investment and trade openness were regressed on real gross domestic product, the co integration method was used and the result indicated that foreign direct investment had no long run relationship with GDP.

Ogbonna and Appah (2012), researched on "Petroleum Income and Nigerian Economy (2000-2009)" where petroleum profit tax was found to have positive and significant relationship with real gross domestic product using the OLS method.

Baghebo and Atima (2013), also researched on "The Impact of Petroleum on Economic Growth in Nigeria (1980-2011)."Foreign direct investment, oil revenue, corruption index and external debt were regressed on real gross domestic product usinf the OLS method and the result showed that oil revenue had negative relationship with real GDP.

Ogbonna and Appah (2012) researched on "Impact of Petroleum Revenue and the Nigerian Economy". In this work the period covered was 1970-2010 using a combination of primary and secondary data obtained in Rivers and Bayelsa States. The result from the ordinary least squares regression suggests that petroleum revenue affects the gross domestic product positively.

Layade and Okoruwa (2012) studied the "Effects of Oil Price Change on Capital Stock of Selected Companies in Agro-Allied Industry in Nigeria" covering a period of 10 years (1997-2006). It employed panel data estimation technique where the result showed a positive and significant relationship between oil price and stock prices.

Oladipo and Fabayo (2012), researched on "Global Recession, Oil Sector and Economic Growth in Nigeria" regressing domestic petroleum consumption, oil price and oil export on gross domestic product, employing the ordinary least squares econometrics technique. The outcome of the work showed that economic growth and domestic petroleum consumption were bi-polar.

The disturbing discrepancy between petroleum sector development and aggregate national output has continued to trigger the research interest of scholars in this area as Adeniyi (2012) in his research work "Oil Export and Economic Growth: Descriptive Analysis and Empirical Evidence from Nigeria" with an objective of finding out the impact of oil export revenue on economic growth; indicates both a short-run and long-run positive relationship exist between oil export and economic growth.

This research study "The Petroleum sector and Economic Growth in Nigeria (1980-2014)" focuses on establishing the impact of the petroleum sector on total output in Nigeria

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proxy by gross domestic product (GDP) and whether or not there is a causal relationship between them. This is informed by the structural segmentation of the economy into sectors and upon which investment and policy decisions are based.

Saibu (2011) studied "Sectoral Output Response to Trade Openness, Oil Price and Policy Shocks in Nigeria: A CVAR Approach." The result showed a negative impact of international oil price shock on both sectoral and aggregate outputs.

Price system mechanism has great influence on the strength and output of any economic sector or industry. The petroleum sector not only in Nigeria but in all oil economies is driven by a price mechanism that is exogenous to the economy. In measuring the impact of the petroleum sector on Nigeria's output growth, it is therefore necessary to include oil price.

Arinze (2011) in "The Impact of Oil Price on the Nigerian economy" revealed that an increase in oil price is always accompanied by a consequent rise in inflation figure, the study was a non-econometric descriptive essay.

Activities in the petroleum sector are determined by public policy, regulations and government control and therefore make it worth the while to consider the impact of state politics in describing the petroleum sector and the economy. The statement of the problem of this work did mention that the resource course hypothesis seems evident in Nigeria and the existence or not of this draws from state political actions and public policy concerning resource utilization.

Omobolaji (2008) studied "Politics Does Matter: The Nigerian State and Oil Resource Curse". The study adopted the inter-governmental fiscal relations system in Nigeria and suggests that the resource curse case is determined by studying the policy choices of politicians towards resource renting and utilization.

Growth is a macroeconomic variable and an important economic goal. It is factored by a host of variables such as the case of economic sectorization, consumption, exports, price situations, foreign direct investment etc.

Mohsen and Mohsen (2011) in studying "Macroeconomic Dynamics in the Oil Exporting Countries: A Panel VAR Study" found that oil shocks significantly affect economic output. They used world oil price of oil exporting countries and GDP as independent and dependent variables respectively and the analysis was based on the impulse response functions (IRFs).

Gap in Literature

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In the related works reviewed, a substantial knowledge gap observed is that all the previous studies made little or no attempt at indepth discussions on the petroleum sector, its compositions, activities, regulations, in addition to poor modeling, methodology, short scope, neglect of important petroleum sector variables. These gaps are closed by adopting standard modeling technique, incorporation of key petroleum sector growth variables (petorluem refining output and petroleum exports variables), use of up-to-date econometric analytical techniques and a sufficiently large scope.

METHODOLOGY

Research Design

Research design focuses on the overall strategy employed in integrating the different components of a study in a coherent and logical way such that addressing the research problem is facilitated. Since the data used for this study are time series data, the research design adopted is the experimental research design. The reason for adopting this type of design is that it combines theoretical consideration with empirical observation (Baghebo and Atima, 2013). This type of design has proved some more than satisfactory level of accuracy in enabling researchers to observe the effects of the explanatory variables on the explained variable. The data employed in this work will be subjected to unit root, co-integration, and error correction preliminary estimation tests; and then, the ordinary least squares (OLS) econometric method will be employed to determine the coefficient of the parameter estimates. The post estimation tests of hypotheses include granger causality test, F-test and the standard error test.

Theoretical Framework

The theoretical framework adopted in this work is the unbalanced growth theory of economic growth and the Uzawa two-sector model of strategic sector development as a way of achieving economic growth. The Uzawa two-sector model is specified as follows

$$Y = Y_2 + {}_pY_1 .... (1)$$

Where Y = Gross National Product

Y_2 = the consumption goods sector

Y_1 = the investment sector

Baghebo and Atima (2013) also researched on "the impact of petroleum on economic growth in Nigeria", specifying the model below

$$GDP = a_0 + a_1OIL + a_2CI + a_3EXDEBT + a_4FDI + \mu .... (2)$$

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Where GDP = Gross Domestic Product

OIL = Oil Revenue

CI = Corruption Perception Index

EXDEBT = External Debt

FDI = Foreign Direct Investment

μ = error term.

Model Specification

In this study, the maintained hypothesis is that the petroleum sector does not significantly impact on economic growth in Nigeria either in the short run or in the long run, and that no causal relationship exists between growth of the petroleum sector and economic growth in Nigeria. In order to estimate these, the model used by Baghebo and Atima is adopted and modified:

GDP = f (ASO, OXP, PRO) ………………. **(3)**

Where

GDP   = Gross domestic product

ASO   = Agricultural sector output

OXP   = Oil export

PRO   = Petroleum refining output

The linearized form of the model is

GDP = β_0 + β_1ASO + β_2OXP + β_3PRO $_+$ U_t ……… **(4)**

Where β_0 = constant term/parameter intercept

B_1, β_2 and β_3 = coefficients of the parameter estimates

U_t = Error term

The variables intended for this study include gross domestic product (GDP) at constant prices, petroleum refining output (PRO), petroleum exports (OXP) and agricultural sector output(ASO).While GDP is the representative variable of economic growth; petroleum refining output and petroleum exports are representative variables of the petroleum sector. Gross domestic product, petroleum refining output and petroleum exports are the key variables while agricultural sector output is the intervening variable since it is also a determinant of growth of economic activities.

Estimation Procedure

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This stage involves the application of appropriate econometric research methods to obtain the numerical values or coefficients for the model. The model specified above was estimated using GDP, petroleum refining output, petroleum exports, and agricultural sector output time series data, and employing the Ordinary Least squares econometric method. The use of the OLS technique draws from a number of strengths which it possesses than other methods. It has such optimal properties as least variance, efficiency, best linear unbiasedness, least mean square error etc. in addition, this method has been used in a wide range of economic relationship empirical observation with satisfactory results and as well is an essential component of most other econometrics technique. The preliminary estimation diagnostic tests procedure to be followed in this study include the Unit Root Test, Co-Integration Test, Vector Error Correction Mechanism and the Granger Causality Test.

Sources of Data Employed

Following the research design adopted in this study, the variables to be used comprise of dependent and independent variables. The independent variables include petroleum refining output (PRO), petroleum exports (OXP) and agricultural sector output (ASO). Since this study is anchored on the economy as a whole, the dependent variable is economic growth proxy by GDP. The data used for the estimation of the parameter coefficients are time series data of gross domestic product (GDP), petroleum refining output (PRO), petroleum exports (OXP) and agricultural sector output (ASO) in millions of naira at constant prices. The data are secondary data sourced from the Central bank of Nigeria (CBN) Statistical Bulletin (2012 and 2015).

ANALYSIS OF RESULT

Table 1: Unit root test result

Variables	ADF @ level	1st Diff	Critical value	Order of integration	Remarks
GDP	-0.833586	-10.86527	-3.552973	1(1)	stationary
ASO	-0.636116	-7.405244	-3.552973	1(1)	stationary
OXP	-1.601538	-4.672702	-3.552973	1(1)	stationary
PRO	-1.822871	-10.37502	-3.552973	1(1)	stationary

Source: researcher's computation using E-views (version 8.0)

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Initially, the individual variables were not stationary at level since the ADF statistic of the variables were less the 5% critical value, but they all became stationary after first differencing. From table 1.0 above, it is observed that the ADF test statistic of the individual variables is greater than the 5% critical values at first difference, (see appendix II). Hence we conclude that all the variables are stationary and are integrated of the same order.

Since all the variables were integrated of the same order 1(1) implying cointegration, the Johansen cointegration test was conducted to test for the long run relationship between the variables. From the result presented, the trace statistic is greater than the 5% critical value at both None[*] and almost 1[*] (see appendix III), and since with at least one cointegrating equation we can conclude a longrun relationship, we therefore reject the null hypothesis and conclude that the variables are cointegrated or that a sustainable long run relationship between gross domestic product, petroleum and agricultural sector variables.

The presence of long run relationship provides for short term fluctuations. These fluctuations are straightened out using the error correction mechanism (VECM) to tie the short run and the long run equilibrium relationships. The conditions to be satisfied are that the coefficient of the error correction term must be negative, fractional and significant. The VECM result presented in table 3.0 above indicates that all three conditions have been fulfilled and it can be said that 0.616033 or 61.60% (appendix IV) of the short term errors are corrected each year and it captures the speed of adjustment at which GDP at short run is ties with the long run.

Implications of the Result

The empirical results indicate that a unit increase in petroleum refining activities trends up the GDP by 51.42576million naira while. The petroleum refining variables appear with positive sign which conform to the theoretical expectation. The F-test indicates a joint influence of the petroleum sector variables and agricultural sector output on GDP and confirms that the overall regression is significant. The overall implication of the results is that the petroleum sector impacts positively and significantly on Nigeria's economic growth and a causal relationship exists between growth of the petroleum sector and economic growth performance of Nigeria. These results are in line with that obtained by Abdulhamid (2011), and Ogbonna and Appah (2012) which indicate a positive relationship between the petroleum sector variables and economic growth in Nigeria.

CONCLUSION, SUMMARY OF FINDINGS AND RECOMMENDATIONS

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In this research, we set out to investige the impact of the petroleum sector on the growth of the Nigerian economy. Related works of other scholars were reviewed and analyzed, and the outcome of this research indicates that the growth of Nigeria economy within the sample period is explained by growth of the petroleum sector. To investigate a proper link between growth of the petroleum sector and economic growth in Nigeria, we conducted the pairwise granger causality test which indicated a one-way causal relationship between growth of the petroleum sector variables and economic growth in Nigeria.

From the unit root test, the variables were initially not stationary at level, but at first difference, they all became stationary and integrated of the same order 1(1), hence, the result of this research can reliably be employed in forecasting and prediction analysis. The cointegration test confirmed a longrun sustainable relationship between the petroleum sector variables (OXP and PRO) and economic growth in Nigeria (GDP), while the vector error correction mechanism result showed that 61.60% of the shortrun errors are corrected each year indicating a considerably fast speed of adjustment.

The research analysis so far leads us to the conclusion that the petroleum sector within the sample period considered had significant impact on the growth of the economy. The casual relationship established indicates that the past values of the petroleum sector activities can reliably enable us to say future values of output of the economy, and based on the outcome of the various tests carried out , we recommend that there should be immediate conclusions and passage of the petroleum industry bill to reposition the petroleum sector as a strategic sector and fully harness its potentials in leading the growth of other sectors and of the economy at large, and that there is need to build at least 3 more refineries to increase petroleum refining output which has a causal relationship with growth of economic activities.

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