

Dynamics of the Downstream Petroleum Sector and Economic Growth in Nigeria

Michael Baghebo, Ph. D & Niyekpemi O. Beauty

¹Department of Economics, Niger Delta University Wilberforce Island, Bayelsa State Nigeria.

Correspondence: Michael Baghebo, Department of Economics, Niger Delta University Wilberforce Island, Bayelsa State Nigeria.

Received: April 20, 2015

Accepted: May 6, 2015

Available online: June 24, 2015.

doi:10.11114/ijsss.v3i4.900

URL: <http://dx.doi.org/10.11114/ijsss.v3i4.900>

Abstract

Deregulation of downstream sector has attracted a lot of studies in Nigeria. Nigeria is naturally endowed with natural oil yet there is still scarcity of petroleum product in the country. Studies have shown that every economy that wishes to grow and develop should encourage the force of market driven economy to operate. This will help eradicate market imperfection that is perceived in the regulated economy. The study investigates the performance of the downstream petroleum sector over the years and its impact on economic growth in Nigeria. The time horizon covered 1980-2012 this is because, data for previous years were not sufficiently available. The study used a simple regression model with ordinary least square (OLS) techniques of data analysis. The result shows that OR, NOR, FDI and CONSUMPT are positive and statistically significant on RGDP. Also the adjusted R^2 shows that the overall model is statistically significant and that deregulation of the downstream sector cannot be avoided. Therefore Government should deregulate the downstream sector in order to attract foreign investors to the sector, this has the tendency of combating unemployment problem in the country, encourage the consumption of petroleum product since competition will make petroleum products readily available and also the overall standard of living will improve.

Keywords: Downstream Oil sector, Real Gross Domestic Product, Foreign Direct Investment, Oil revenue, Non-oil revenue.

1. Introduction

Deregulation is the process of transforming an economy or industry from strict state control to that which is open to all interested participants and usually by forces of demand and supply. Deregulation is mainly done in the downstream sector of the petroleum industry.

The petroleum industry in Nigeria is the largest industry and main generator of GDP in the nation. Since the discovery of oil in the Niger Delta in the late 1950s, the oil industry has been marred by political and economic strife due to a long history of military regimes in the country.

Gbenga (2008), asserts that Nigeria joined the ranks of oil producers in 1958 when its first oil field came on stream producing 5,100 barrel per day. After 1960, exploration rights in onshore and offshore areas adjoining the Niger Delta were extended to other foreign companies namely Mobile producing Nigeria unlimited, ELF petroleum Nigeria limited, Nigeria Agip oil company limited, Chevron Nigeria limited, Texaco Overseas petroleum limited etc. The end of the Biafra war in 1970 coincided with the rise in the world oil price, and Nigeria was able to reap instant riches from its oil production.

Meanwhile, before discovery of oil in large quantity which brought about commercialization of the downstream oil sector, Agriculture was the main-stay of the Nigerian economy. Initially, interest of government in the oil industry was limited to collecting royalties and other dues which oil companies offered to pay for it. In addition to making laws, albeit rudimentary, to control and regulate the activities of the oil industry. However, government was soon to step up its involvement in the oil industry, as the oil becomes increasingly important to the country. Hence, the Nigerian government made conscious efforts at controlling and monitoring the oil exploration and exploitation activities in the country. By the late 1960s, it was obvious that Department of Petroleum could not cope with the upsurge in the volume and pace of oil activities.

The Ministry of Petroleum Resources (MPR) was merged with government owned Nigerian National oil Corporation (NNOC) to form the Nigerian national Petroleum Corporation (NNPC) under Decree No 33 (1977), as a wholly government owned company in fulfilment of government policy objectives to fully participate in the oil and gas industry. It was charge with the responsibility of exploring, processing, transporting, refining, distributing and marketing of petroleum and its refined products (both upstream and downstream sector). Also, under the same decree established the petroleum inspectorate as an integrated part of the NNPC. Its sole responsibility is the statutory control and regulation of all industrial activities upstream and downstream. In view of this, General Ibrahim Babangida's administration made efforts to re-organize and restructure NNPC. More importantly, it was geared towards preparing the corporation for commercialization through the injection of strong business ethic and goals oriented management. At the bottom of it was the republication that nations oil industry needed to be run more profitably for greater efficiency and stimulate growth in order to minimize the benefit of our oil which is the goose that lays Nigeria's golden eggs needed an effective and sufficient antidote to rescue it from the kind of decline the industry was experiencing and to foster growth and socio-economic development of Nigeria's Economy.

The demand to turn Nigeria's downstream petroleum sector over to free market forces stared within the last ten years due to government's inability to meet up with the level of funding required to sustaining the operation of the nations' four refineries which are operating below capacity utilization as a result of Negligence of previous successive administrations. The issues relate to government's claims that deregulation of the downstream sector attract investors, stimulate growth and development, reduce scarcity and check smuggling of petroleum products across Nigeria's borders.

Nigeria government refineries in: Port Harcourt I and II, Warri, and Kaduna have a combined capacity of 438,750 bbl/d, but problems including sabotage, fire, poor management and lack of regular maintenance contributed to the operating capacity of about 214,000 bpd, as at 2009. The industry no doubt, is widely acknowledged as the nation's live-wire because it creates employment opportunities for Nigerian (particularly with the enactment of local content policy), contribute to the growth of Nigeria gross domestic product as well as the government revenue, increases foreign exchange reserves.

Nevertheless, despite these benefit, the oil industry is plagued by various problems which the federal government believe that deregulation of the downstream sector was a solution. The downstream sector of the oil and gas industry is currently partially deregulated, making it difficult for prices of petroleum products to be market determined. The sector was regulated, with government and her major partners maintaining a monopoly of supply of petroleum products. The dominance of these firms in the market has made the downstream sector in Nigeria an oligopolistic one. Due to the market structure, the leading marketers dictate the trends in the market while the fringe independent marketers struggle to match up with the competition (Mars ,2009). However, in line with the nation's economic reform agenda, that was launched in the 1980s but effected gradually till date, policy makers have embarked on a regime of deregulation of the sector, which was intended to remove price control mechanisms that have undermined the growth of the sub- sector in previous years, allowing private stakeholders to complement the government efforts in developing the industry. As a major solution to the economic crisis experienced in Nigeria in 1980s, the Structural Adjustment Programme (SAP) was introduced with the central aim of deregulating the economy. The sub-sector is particularly volatile in recent times. (Aigbedion and Iyayi,2007). The downstream sub sector is bedevilled by the following:

1. State of the Refineries
2. Product Availability
3. Probity
4. Revenue Maximization
5. Promoting National Interest

State of the Refineries: The downstream oil sub-sector has been constrained by the poor state of the nation's refineries, which have being producing at minimal capacities in the past years, despite huge expenses incurred on Turnaround-maintenance (TAM). Poor maintenance of Nigeria three refineries located in Warri, Port Harcourt and Kaduna with a combined installed capacity of 445,000 bpd, led to a drastic fall in production level to 15 % of the total installed capacity. The sudden closure of the Kaduna and Warri refineries, during this period, so as to allow for TAM, contributed to the decrease in production of refined products. The development led to massive importation of petroleum products to fill demand gaps that exist in domestic consumption. According to Maram(2012), Nigeria, Africa's top oil producer, relies on imports to meet about 70 percent of its domestic fuel needs, due to lack of refining capacity. However, the huge cost associated with importation of petroleum products was a major reason for government emergent reform and the hike in prices of petroleum products over the years. In addition, government has signified its Intention to

relinquish its holding in the nation's refineries and make its percentage holding available to the private investors. This is expected to complement its efforts toward complete deregulation of Nigeria's oil industry.

Product Availability: In 2003, the Petroleum Products Pricing Regulatory Agency (PPRA) announced a program of deregulation for the sector, which was aimed at stimulating adequate supply of petroleum products, fostering appropriate pricing mechanisms and eliminating sharp practices in the industry. The policy framework discontinued government monopoly on the importation of petroleum products, thereby opening the investment field for private investors and stakeholders in the industry to source their products. However, this policy allowed independent marketers to determine prices of petroleum products in line with their cost of supplies. This development generated a deep concern, particularly in the ranks of organized labour, which saw the policy shift as capitulation of government to the demands of oil marketers against the interest of consumers. Despite the nation's huge endowment of crude oil and gas and the extensive infrastructures available in the sector for distribution and marketing of petroleum products, the downstream sector has been hit by increase instability, hallmarked by a dearth of product to supply. During this period, sharp practices thrived in the industry with independent marketers arbitrarily hiking prices beyond approved rates. Product adulteration, diversion/smuggling, bunkering, and other illegal acts were very common.

Indeed, official prices rose sharply from 26 to 65 (naira) per litre between 2002 and 2011. The sector is characterized by supply uncertainty; fuelled by the mismanagement of the nation's refineries. Furthermore, the House of Representative probe of the Sub-sector in 2012 revealed that in 2011, the IPMAN got less than 1% of the fuel importation contracts, compared to the huge number of its retail outlets and storage facilities. The association called on the Federal Government to remove the briefcase contractors from the system and ensure that regulatory agencies did not provide a platform that encouraged cutting of corners (Kolawole, 2012). This indicated that the fuel distribution system in the nation was defective, resulting into perennial scarcity of the products.

Probity: According to Kolawole (2012), the astronomical rise of fuel subsidy from N623 billion in 2010 to N1.7 trillion in 2011 led to the 2012 investigation by the House of Representatives on subsidy regime. It revealed the rot in the nation's oil sector, coupled with the conflicting facts and figures being churned out to the citizens. The funds being executed yearly on subsidy could have been used to build new refineries so that the country could go beyond refining for local consumption to exporting refined products, as well as national developmental purposes. The probe revealed the following;

Defective Records: Okonjo-Iweala claimed that the government had paid the sum of N1.4 trillion on fuel subsidy in 2011, the Central Bank of Nigeria (CBN) governor, on his part, claimed that the subsidy on fuel had hit N1.7 trillion, while the committee of the House, maintained that from documents at its disposal, the amount of money to be paid on fuel subsidy might hit N2 trillion. In fact, Sahara Oil, with only six staff but got as much as N2.3 billion to import fuel. The manager did not come with any document to back his claim (Iheanacho, 2012). The conflicting records removed all doubts as to the lack of credibility in the sector's record-keeping endeavours.

Abuse of Policy: The Independent Petroleum Marketers Association of Nigeria (IPMAN), stated that the agencies connected with fuel subsidy regime, used to award fuel importation contracts to "briefcase importers" and as a result, contributed to the abuse of the subsidy regime in the downstream sector of the petroleum industry. This resulted in payments for fuel that was never delivered. In 2010, Knightsbridge, a logistics company got approval to import 75,000 metric tonnes of fuel. Adetutu (2012) stated that It was absurd that a logistics company would import fuel and participate in the subsidy scheme.

Oil theft/spill: A report analyze the effect of oil theft in Nigeria revealed in July 2013 that Nigeria lost out on \$10.9 billion in potential oil revenues between 2009 and 2011 (fin24.com, 2013). Oil spills in Nigeria are a common occurrence; it has been estimated that between 9 million to 13 million barrels have been spilled since oil drilling started in 1958. The government estimates that about 7,000 spills occurred between 1970 and 2008. The Causes include corrosion of pipeline and tankers (accounts for 50% of all spills), sabotage (28%), and oil production operations (21%), with 1% of the spills being accounted for by inadequate or non-functional production equipment. A reason that corrosion accounts for such a high percentage of all spills is that as a result of the small size of the oilfield in the Niger Delta, there is an extensive network of pipelines between the fields. Many facilities and pipelines have been constructed to older standards, poorly maintained and outlived their estimated life span. Sabotage is performed primarily through what is known as bunkering where the saboteur taps a pipeline, and in the process of extraction sometimes the pipeline is damaged. Oil extraction in this manner can often be sold for cash compensation.

Oil spillage has a major impact on the ecosystem. Large tracts of the mangrove forests, which are especially susceptible to oil (this is mainly because it is stored in the soil and re-release annually with inundation), have been destroyed. An estimated 5-10% of Nigerian mangrove ecosystems have been wiped out either by settlement or oil. Spills take out crops and aquacultures through contaminated, and sheen of oil is visible in many localized bodies of water. If the

drinking water is contaminated, even if no immediate health effects are apparent, the numerous hydrocarbons and chemicals present in oil represent a carcinogenic risk.

Revenue Maximization

The Nigerian Ports Authority(NPA) claimed at the legislative probe of the sector in 2012, that it had granted waivers to the Nigeria National Petroleum Company(NNPC) to the tune of N1.77 billion and \$135.39 million between July 2009 till date on the orders of the Federal Government, while the corporation was owing NPA about N6 billion. The Nigerian Custom Service also stated it was sidelined in the subsidy regime, thus, the importers were not charged for imports. (Kolawole,2012).These indicated a gross loose of the needed revenue for developmental purposes.

Promoting National Interest

During the Legislative probe of the sector in 2012, the following revelations emerged (Kolawole,2012)

Defeated Local Content (LC) Policy: The Indigenous Ship Owners Association of Nigeria (ISOAN) alleged that the country lost about N45 trillion annually due to the preferences given to foreign ship owners over the indigenous owners. ISOAN accused the NNPC of deliberately sidelining Nigerian ship owners from lifting fuel both locally and internationally. It maintained that the NNPC set unnecessary bulwarks that made it impossible for Nigerian vessels to take part in the lifting of oil that were either imported or locally sourced. This further short changed Nigeria as she lost as much as N3.7trillion monthly in freight or shipping costs. This clearly defeated government's local content (LC) policy.

Lopsided National Development: The Nigerian citizens are impoverished, based on the United Nation Human Development Report of 2009, 83.9% of Nigerians live below 2 dollars a day. The nation is thus below virtually all the West African countries including Cameroon, Cote d'Ivoire, Gabon, Mali, Mauritania, Sierra Leone, Togo, Gambia, Ghana, Guinea Bissau, Benin, Togo, Senegal, and even Chad. This shows the very lopsided distribution of the purchasing power in oil rich Nigeria in the hands of a few ruling elites to the detriment of the majority. Apart from the middle class that manages to scratch out a living, the poor wallows in abject poverty while the few political elites flaunt their ill-gotten wealth without any sense of modesty. (Tosanwumi,2012).

2. Literature Review

The petroleum industry has attracted a lot of studies. In Nigeria, the literature on the industry is growing. A study of this nature can only make a selective review of the relevant and related studies.

The downstream sector covers the processing of crude oil, its distribution as well as sales. In other words, the downstream oil industry is the business of importing, exporting, re-exporting, shipping, transporting, processing, refining, storing, distributing, marketing and/or selling, crude oil, gasoline, diesel, liquefied petroleum gas, kerosene, and other petroleum and crude oil products (Philip 2005).

Ernest and Young (1988) posit that deregulation and privatization are elements of economic reform program charged with the ultimate goal of improving the Overall economy, through properly spelt out ways. For example, freeing government from the bondage of continuous financing of expensive projects which are best suited for private investment by the sale of such enterprises; encouraging efficiency and effectiveness in resource utilization; reducing government borrowing while raising revenue; promoting healthy market competition in a free market environment; improving returns from investment and broadening enterprises share ownership, thus engendering capital market development. This is a systematic transformation of an economy or industry from strict state control to one that is open to all interested players and usually driven by forces of demand and supply. Deregulation entails the removal of government bureaucratic bottlenecks from the economy, allowing the participants in the sector the opportunity of direct and independent sourcing of product.

Deregulation of a Country's economy could be conceptualized as divestiture or market economy. This refers to private participation in a Country's economic activities. It is to ensure competitive economic system devoid of monopoly and allow price mechanism of demand and supply principle of the economy to prevail. Ahmed (1993), emphasize that deregulation entails giving greater space to the private sector as the prime mover of the economy, contrary to emphasis on the dominance of public sector. To achieve this objective, greater roles are assigned to market factors as against rigid regulation by the government. It's aimed at stabilizing and restructuring the economy for a durable growth.

According to Ayodele (1994), deregulation is one essential aspect of price and market reforms which entrails both unshackling private sector development through removal of government restrictions on private economic activity and divestiture of the state assets particularly public Enterprises (PEs) into private hands. The main objectives of deregulation include: introducing a market economy, increasing economic efficiency, establishing democracy and guaranteeing political freedom as well as increasing government revenue (Dhanji and Milanovic, 1991). The goal of the

Nigerian government in adhering to the principles of privatization and liberalization is influenced by the successes of other countries in doing the same. It is also assumed that economics based on private prosperity are better institutions for preserving individual freedom than economies where the productive apparatus is the public sector (Ijhaiya, 1999). Deregulation demands that government restrict itself to the areas of governance and providing guidelines for the operation of economic activities by private individuals. This implies releasing its controls of certain or many of the important aspect of the industry in which is presently regarded in. This involves systematic removal of regular controls, structure and operational guidelines that inhibit orderly growth, completion and healthy efficiency.

In Macroeconomic perspectives, deregulation of the downstream oil industry means that market forces of demand and supply would be the main determinant of product prices. This entails removal of all aspect of regulations and control over a thing or activities and the complete cessation of control values from a situation, in the various activities thereby allowing the invisible hands to dictate the pace of the working of the economic forces.

Richard (2012) asserts that Deregulation of the downstream oil sector remains the path forward in expanding opportunities for economic growth and a competitive downstream sector. If regulation is limited to oversight and supervisory functions, aimed at guaranteeing quality of products and preventing consumer exploitation, then the process of deregulation could help achieve greater cost-effectiveness.

Richard (2012), further asserted that research and analysis show that even if all the country's refineries were to operate at full capacity, there would still be a petrol supply gap of 15 million litres per day. Therefore, importation will remain inevitable until additional refining capacities are built through the on-going Greenfield Refinery Project.

In a nutshell, deregulation of downstream petroleum industry means official withdrawing from fixing of petroleum product prices and services. It does not entails that the government would continue to be involved in the area of national policy articulation and the policy in the industry, to ensure security of life and property and the environment as well as ensuring equity and fair dealing among all the stakeholders in the industry. Hence deregulation is a market place where:

1. Crude oil is sold to all refiners at international prices.
2. All willing and able operators are free to import fuel that meets quality specification.
3. There is unrestricted entry into the industry and unsubsidized exit
4. The petroleum product marketing company (PPMC) is transformed into common carrier.
5. The department of petroleum resources (DPR) is compared to regulate standards quality safety and licensing in industry.

The proponents of deregulation of the downstream oil sector of the Nigerian economy posit that the liberalization and deregulation of the downstream oil sector would finally actualize the objective of ending perennial fuel scarcity and maintaining sustainable fuel supply across the polity.

Odidison (2003) opined that deregulation of the downstream oil sector would bring sanity into the oil industry since smuggling of petroleum products, vandalization of pipeline and all other vices in the sector will be totally removed. He however agreed that the domestic price of oil will increase but averred that the rationality is that the smugglers are likely to reduce their activities. According to Akinmade (2003), the causal factors responsible for the call for deregulation include corruption, illegal bunkering and managerial problems which contributed to the large scarcity of petroleum products recently experienced.

Ogunade (2003), supporting the corruption claims, documented that the Revenue Mobilization and Fiscal Commission is still emphatic that NNPC stores the nation's oil earnings in illegal dedicated accounts. Akinmade (2003) opine that about 200,000 barrels of crude oil per day, representing 1% of Nigeria's export quota are stolen on a daily basis by mid-scan thieves and their official collaborators. This stolen crude valued at N618,530 daily, has been traced to Cameroon, Cote d'Ivoire and Brazil; and therefore concludes that with deregulation, there would be new investment opportunities for both current and new participants in terms of private refineries that would meet the demand of the federal government, and averred that this is the essence of deregulation of the downstream oil sector.

He further stated that the effectiveness of the deregulation policy in the oil sector would generate funds, reduce smuggling of petroleum products and remove economic malaise that emanates as a result of tax evasion, duties and tariffs evasions as well; and that the incidence of perennial increase in the price of petroleum product would face out since price mechanism would be attained through deregulation policy.

Olawore (2014), pointed out that the rising demand for petroleum products has made deregulation in the downstream oil sector compelling for efficiency in the sector, as it would ensure increased opportunity to control business flows through integration of marketers ability to be involved in a broad range of activities from refinery to the actual sales point. He furthered that the government controlled downstream oil sector has created simulative situation that has shot

up the price of products far above government fixed price and efficient supply and distribution of fuel in the downstream sector is only guaranteed when deregulation or even privatization is adopted, competition will definitely determine an actual price for a produce.

Agbonyi (2009), opine that the products were sold to friends of the NNPC officials who have private depots/pumps where they sell at high cut-throat prices is the actual cause of the petroleum scarcity cited by the opponents as the reason for deregulation calls. He further stated that the petroleum marketers have been noted to divert petroleum products meant for some state to private hands far away from the states, for which they are meant for, is part of the causes of the lingering issues in the downstream oil sector necessitating the call for deregulation.

Barkido (2010) stresses that the benefits of deregulation are enormous as it is meant to eradicate huge revenue spent as subsidy and that between 2006 and 2009, about N25 trillion was spent which is why its removal have become so imperative.

3. Theoretical Framework

The Deregulation policy has globally being embraced by several countries, in order to lessen public sector dominance and for developing a liberalized market while ensuring adequate supply of products. Such is the story in Peru, Argentina, Pakistan, Chile, Philippines, Thailand, Mexico, Canada, Venezuela, Japan and USA, all of which have systematically dismantled their State-owned oil companies, for a significant turning point in the success story of their Oil industry reform efforts. (Loretta, 2004)

Theoretically, the concept of deregulation is based on the **Neoliberal school of Thought**. It is based on the doctrine of competition and profit motive founded on free market pricing and freedom from the interfering hands of state regulation (Wikipedia,2011).This theory also supports the fact that deregulation could reap the advantages of the market system and competition, namely; effectiveness, productivity, and efficient service. The theorists believe that Privatization would strengthen market forces with some degree of deregulation, economic liberalization, relaxation of wage and price controls (Ugorji, 1995). The deregulation of Nigerian economy is an idea packaged and sold by the metropolitan agencies such as World Bank and International Monetary Fund (IMF). The aim was to remove encumbrances placed by ambitious governments and bureaucrats on the free operation of a market economy in favor of the market economy with its vaunted claim to efficiency (Mishan, 1983). To promote capitalism and liberalism, neo-colonialists argued that a nation's true economic wealth is derived from the industry and the economic right to choice of the people. That the state should therefore only engage in the provision of internal and external security.

It also added that liberalization and deregulation of the downstream sector would open it up for foreign investments, and, the incidents of petroleum products smuggling and inefficiencies in the sector..

Exhaustible Resource Theory, which originated from the intellectual work of Hotelling (1931). It recognizes that oil and other exhaustible resources are only temporarily available, and as such its price should be treated as user cost or depletion charge, which compensates future generations for a denial of access to the product. Capital Replacement Approach (CRA) is based on the principle of cost recovery, covering production and refining. At the minimum, the price is expected to be consistent with the cost of replacing capital in the production process.

According to Adam Smith, Government should not interfere in economic process and should follow a policy of *laissez faire*. The syllogism is that in a free market, people acting to further their own self-interest will be led by an invisible hand to promote efficiently and the interest of the society as a whole. Thus, with competitive markets, and an absence of government regulation, the resulting market prices bring about an optimum allocation of resources, in that consumers receive the goods they want at the lowest possible cost.

4. Materials and Methods

The data for this study are secondary, obtained from various issues of Annual Reports and Statement of Accounts; Statistical Bulletin published by the Central Bank of Nigeria, and the National Bureau of Statistics, Nigeria. The data cover the period between 1980-2012.

The method of analysis used was the ordinary least square method (OLS). This approach, which is quantitative technique, includes tables and test of significance at 5%, 1%, and 10% levels

5. Model Specification

The model for this study was derived from the neoliberal school of thought which emphasized liberal policies to stimulate economic growth of nation and is thus, consistent with the study.

$RGDP = F(OR, NOR, CONSUMPT, FDI, UNEMPL)$

The multivariate form of the model is given as:

$$RGDP = a_0 + a_1OR + a_2NOR + a_3CONSUMPT + a_4FDI + a_5UNEMPL + U_i$$

It is expected that $a_1 > 0, a_2 > 0, a_3 > 0, a_4 > 0$ and $a_5 < 0$

Where RGDP is Real Gross domestic product,

OR is Oil revenue,

NOR is Non Oil Revenue

CONSUMPT is Consumption of Crude Oil,

FDI is Foreign Direct Investment,

UNEMPL is Unemployment

a_1, a_2, a_3, a_4 and a_5 are parameters and

U_i the stochastic or unexplained variation

6. Data Analysis and Interpretation of Results

Using the Econometric (Eview 3.1) software for windows on a set of time series data for the period (1980-2012) the following ordinary least square (OLS) estimate were obtained:

Philip Perron Unit Root Test

Table 1

Variables	levels	1 st Diff	2 nd Diff	Lag	decision
RGDP	2.673280	-6.871651	-13.73349	2	1(1)
OR	0.850562	-7.388607	-13.09195	2	1(1)
NOR	2.347629	-8.710721	-13.18424	2	1(1)
CONSUMPT	-2.609143	-5.787375	-8.965175	2	1(1)
FDI	-3.118899	-5.357291	-5.998798	2	1(0)
UNEMP	0.011993	-6.559316	-14.14348	2	1(1)
ECM(-1)	-11.51603	-26.22814	-19.34437	2	1(0)

Critical Value

1%	-3.6496
5%	-2.9558
10%	2.6164

To test the Stationary status of the variables (RGDP, OR, NOR, CONSUMPT, FDI, UNEMP) in the model, we used Philip-Perron's unit root test with linear deterministic trend. This is done in order to avoid spurious and nonsensical regression results. The result revealed that FDI is stationary at Levels while RGDP, OR, NOR, CONSUMPT and UNEMP attained Stationarity at first difference. The critical values which form the bases of our decision making are 1%, 5% and 10% levels respectively.

The hypothesis of non Stationarity of the variables is therefore rejected at the respective critical levels, because the variables RGDP, OR, NOR, CONSUMPT and UNEMP attained Stationarity after first difference while FDI was stationary at level.

The next step is to establish whether long-run equilibrium relationship exist among the variables in the model using Johansen Cointegration rank and Marxeigen value test. If the variables are Cointegrated, they are referred to as policy variables. The statistical equivalence of long run equilibrium relationship among variables in a model is Cointegration. According to Engel Granger, if two or more variables are Cointegrated, the relationship between or among them could be represented as an error correction method (ECM)

Table 2. Johansen Cointegration Test

Sample: 1980 2012

Included observations: 30

Test assumption: Linear deterministic trend in the data

Series: RGDP OR NOR CONSUMPT FDI UNEMP Lags interval: 1 to 1

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesize No. of CE(s)
0.987388	279.2202	94.15	103.18	None **
0.894442	148.0260	68.52	76.07	At most 1 **
0.810355	80.57119	47.21	54.46	At most 2 **
0.520339	30.69318	29.68	35.65	At most 3 *
0.189497	8.652918	15.41	20.04	At most 4
0.075341	2.349912	3.76	6.65	At most 5

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 4 cointegrating equation(s) at 5% significance level

The result in table 2 (cointegration result) indicates the presence of four cointegrating equations at 5% and 1% level of significance. This means that long run equilibrium relationship exist between RGDP and other variables used in the model. We therefore reject the null hypothesis which says there is no long run equilibrium relationship (cointegration) among the variables (RGDP, OR, NOR, CONSUMPT, FDI, UNEMP) in the model.

We proceed to perform the over parameterized and parsimonious error correction test using error correction method to account for short-run dynamic adjustments required for stable long run relationship among the variables in the model. The over parameterized model is presented in table 3. The over parameterize model account for model misspecification problems as a step towards arriving at a preferred or parsimonious model. This is presented below:

Table 3. Over-Parameterized Test

Dependent Variable: RGD

Method: Least Squares

Sample(adjusted): 1982 2011 Included observations: 30 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-276620.0	58725.10	-4.710422	0.0004
OR	0.001706	0.005190	0.328744	0.7476
OR(-1)	0.011330	0.003031	3.738566	0.0025
OR(-2)	0.027475	0.010131	2.712143	0.0178
NOR	-0.055888	0.036486	-1.531798	0.1495
NOR(-1)	-0.059936	0.041597	-1.440872	0.1733
NOR(-2)	-0.018156	0.027341	-0.664059	0.5183
CONSUMPT	615.2331	204.9297	3.002167	0.0102
CONSUMPT(-1)	1558.671	284.2031	5.484356	0.0001
CONSUMPT(-2)	68.64970	175.3473	0.391507	0.7018
FDI	-0.014910	0.019708	-0.756565	0.4628
FDI(-1)	0.096088	0.033547	2.864263	0.0133
FDI(-2)	0.075952	0.029287	2.593368	0.0223
UNEMP	1643.852	981.5278	1.674789	0.1178
UNEMP(-1)	5452.541	1226.995	4.443817	0.0007
UNEMP(-2)	1226.987	1515.110	0.809834	0.4326
ECM(-1)	-0.596081	0.183110	3.255316	0.0063
R-squared	0.998747	Mean dependent var		423841.2
Adjusted R-squared	0.997204	S.D. dependent var		169479.0
S.E. of regression	8961.427	Akaike info criterion		21.33633
Sum squared resid	1.04E+09	Schwarz criterion		22.13034
Log likelihood	-303.0450	F-statistic		647.4570
Durbin-Watson stat	2.132693	Prob(F-statistic)		0.000000

In the over parameterized model as shown in table 3, the error correction term (-1) is correctly specified. It is negative and statistically significant. The negative sign in the coefficient of the ECM conforms to our earlier assertion that the variables in the model are Cointegrated. The coefficient of the ECM is the speed of adjustment from short-run disequilibrium to long-run equilibrium. It also means that about 60 percent disturbances or shocks in the previous year adjust back to equilibrium in the long-run or current period. The spread of adjustment is however high.

The adjusted r^2 in the over-parameterized models is 0.997204. This means that about 99percent of the variation of the dependent variable RGDP is explained jointly by all the regressors in the model. The explanatory power of the model is

high and is a good fit. The F statistics of 647.4570 with probability of 0.000000 is highly significant. This means that the independent variables in the model (OR, NOR, CONSUMPT, FDI, UNEMP) are jointly significant i.e the variables fit well in the model.

The AIC and Schwarz information criteria are within the acceptable limit and therefore shows correct specification of the model. The model passes both the diagnostic and the normality test. The Durbin Watson statistics 'D' of 2.132693 means that there is absence of auto correlation.

The next step is the formulation of the parsimonious model through a stepwise reduction of the jointly insignificant variables in the overparameterize model until the preferred model is obtained. It is worthy to note that some jointly insignificant variables in the overparameterize model may be retained in the parsimonious model because it relate to the current dynamics of the economy and useful for policy prescription. The parsimonious result is presented in table 4.

Table 4. Parsimonuous Test

Dependent Variable: RGDP

Method: Least Squares

Sample(adjusted): 1981 2011

Included observations: 31 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-12651.34	59616.49	-0.212212	0.8337
OR	0.016624	0.006175	2.692129	0.0127
NOR	0.093019	0.027111	3.431085	0.0022
CONSUMPT	1236.553	237.1684	5.213820	0.0000
FDI	0.059333	0.016568	3.581097	0.0015
UNEMP	-2315.502	1810.535	-1.278904	0.2132
ECM(-1)	-0.109476	0.046628	-2.347831	0.0369
R-squared	0.973306	Mean dependent var		418267.4
Adjusted R-squared	0.966633	S.D. dependent var		169495.7
S.E. of regression	30961.28	Akaike info criterion		23.71454
Sum squared resid	2.30E+10	Schwarz criterion		24.03835
Log likelihood	-360.5754	F-statistic		145.8475
Durbin-Watson stat	2.114807	Prob(F-statistic)		0.000000

All the variables in the parsimonious result conform to apriori expectations and are statistically significant except unemployment that is statistically insignificant. The positive and significant impact of the variables except unemployment, indicate that government deregulation effort in the downstream sector is yielding good result. This implies that complete deregulation of the sector will increase private sector investment, and reduce the rate of unemployment and enhance economic growth of the country. The positive and significant impact of Oil revenue on economic growth is consistent with the findings of Richard (2012). His study reveals that deregulation of the downstream sector will improve sector efficiency, encourage competition, attract foreign direct investment, increase government revenue from the oil sector and increase the growth rate of the economy. The negative and statistically insignificant impact of unemployment on economic growth is something to worry about. But as asserted by Barkido (2010) the huge revenue spent on subsidy is responsible for the high rate of unemployment recorded in recent years. Complete deregulation of the downstream sector will save government revenue and direct government spending to employment generation. Akinmade (2003) also opine that the high rate of corruption in the downstream oil sector has adversely affected the level of employment and economic growth. This development is contrary to the Hotelling 1931 theory of exhaustible resource extraction that emphasized on investing the revenue from exhaustible resources on interest bearing financial assets and not through corruption. The 97 percent variation in the dependent variable that is captured in the adjusted R^2 is explained jointly by all the independent variables leaving about 3 percent for the unexplained variables. The explanatory power of the model is very high. The variables are perfect fit. All the variables in the model are jointly significant. This is reflected in the high F statistic value which is significant. The Durbin-Watson statistics indicate absence of auto or serial correlation.

The ECM(-1) is negative and significant, and therefore conforms to apriori expectations. The speed of adjustment from the short run dynamics to long run equilibrium is about 10 percent implying slow speed of adjustment.

7. Conclusion

The study has empirically demonstrated the dynamics of the downstream sector in Nigeria. The effort made so far to deregulate the sector for better service delivery is a positive step but need a more pragmatic and holistic approach on the

part of policy makers. The positive and significant impact of Oil revenue, Foreign direct investment, Consumption and Non-oil revenue on economic growth in an era of partial deregulation implies that total deregulation of the downstream sector will improve sector efficiency, avoid waist and frivolous government expenditure and eradicate corruption that beset the sector in recent years. Petroleum products will be available in sufficient quantity and competition among producers will reduce price and make consumers better off.

8. Recommendations

Based on the research findings, the following recommendations were prescribed.

1. Deregulation policy should be geared towards encouraging foreign investors into the downstream sector of the petroleum industry. The competition in the sector will lead to orderly growth and efficiency in the sector.
2. Government should deregulate the downstream sector in order to encourage consumption of petroleum product. If the downstream sector is deregulated petroleum product will be available for consumption. The increasing demand for petroleum products will witness more investment in the downstream sector.
3. Deregulation of the downstream sector will also improve the overall standard of living. When the citizens are employed, they would have more money to spend to meet their immediate needs. This will improve their general wellbeing.
4. Government should deregulate the downstream sector since it would earn more revenue. The revenue generated can be invested in other sectors of the economy to strengthen the growth of other sectors of the economy.

References

- Adetutu F. (2012). Senate demands documents from oil marketers• Total, Oando, Mobil shun Senate probe www.sunnewsonline.com/.../2012/feb/14/national-14-
- Adagba O, Ugwu, S. C., & Eme, O. I. (2001) Deregulation and Anti-Subsidy Removal Strikes in Nigeria, 2000 -2012. *Arabian Journal of Business and Management Review (OMAN Chapter), 1(7), February 2012*
- Agboyi, T. (2009). Fuel at #100 Per Litre. *The Nigerian Punch, Nigeria, Lagos, 13.*
- Ahamed, A. (1993). *Forward to Central Bank of Nigeria: Perspectives of Economic Policy Reforms in Nigeria*, Ikeja: Page Publishers Services Ltd.
- Aigbedion I. D., & Iyayi, S. E. (2007). Diversifying Nigeria's Petroleum Industry, *International Journal of Physical Science, 2(10), 263-27 October 2007*
- Akinmade, T. N. (2003). Privatization: Bridging Hope Back, *The Nigerian Tell Magazine, 2(2), 48.*
- Ayodele, A. S. (1994). Elements of the Structural Adjustment Program: Privatization and Commercialization in The *Nigerian Journal Economics and Social Studies, 36(1).*
- Barkido (2010). Assessment of the implication of full scale Deregulation of the Downstream Oil sector on the Nigerian Economy in *Global, Journal of Political Science and Administration, 1(2), 23-48*
- Central Bank of Nigeria. (2011). *Central Bank of Nigeria Statistical Bulletin*. Abuja: Central Bank of Nigeria.
- Dhanji, F., & Milanovic. (1991). Privatization in Eastern and Central Europe: Objectives, Constraints and Models of Divestiture, *A World Bank Research Working Paper, 770.*
- Ernest, P., & Young, C. (1988). *The Colonial State and Postcolonial Crisis, in the Transfers of Power, 1960–1980*. New Haven and London: Yale University Press. Guardian. 2002. Lagos.
- Gbenga, B. (2008). Investing in Nigeria's Oil and Gas Industry, www.gbclaw.com/investing_in_Nigeria_OandG%20Industry.pdf
- Hotelling, H. (1931). The Economics of Exhaustible Resources, *Journal of Political economy, 39(2)*. <http://dx.doi.org/10.1086/254195>
- Iheanacho N. (2012). Fuel subsidy: EFCC begins investigation of beneficiaries. www.sunnewsonline.com/.../national-14-02-2012-008.html
- Ijhaiya, G. (1999). Privatization and Commercialization of Public Enterprises in Nigeria in Killick, T. (1989). *Economic Development and the Adoptive Economy. Overseas Development Institute Working Paper, 31.*
- Kolawole D. (2012). Fuel subsidy probe Saving Nigeria's oil sector from vultures. [www.tribune.com.ng/.../6287-fuel-subsidy-probe-saving-nige... -](http://www.tribune.com.ng/.../6287-fuel-subsidy-probe-saving-nige...)

- Loretta, O. (2004). Deregulation of The Nigerian Downstream Oil Sector Keeping Faith With A Global Trend www.pppra-nigeria.org/article/details.asp [www.vanguardngr.com/.../why-oil-sector deregulation-is-imp...](http://www.vanguardngr.com/.../why-oil-sector-deregulation-is-imp...) - Cached 21 Dec 2011
- Maram M. (2012). Nigerian Parliament Probes 'Largest Fraud' in \$12.6 Billion Fuel. mobile.bloomberg.com/.../2012...10/nigeria-probes-possible-f...
- MARS, (2009). Research Sector ReportJ... www.marinasecuritieslimited.com/.../MARS_Research_Petroleum_M
- Misham E. (1982). Introduction to Political Economy, London: Hutchinson.
- Odidison, O. (2003). Fuel Price Hike: OPS Union React”, *The Nigerian Business Times*, 17.
- Ogunade, K. (2003). Why Fuel Price Should not Exceed #30.00 Per Litre. *The Nigerian Guardian, Nigeria*, 36.
- Olawore, B. (2012). Only full deregulation of downstream sector will end fuel scarcity. [http://www.vanguardngr.com/2012/11/only-full-deregulation-of-downstream- sector-will-end- fuel-scarcity](http://www.vanguardngr.com/2012/11/only-full-deregulation-of-downstream-sector-will-end-fuel-scarcity)
- Philip, O. (2005). *Nigeria Oil and Gas Downstream sector (Refining and Marketing) (Report 2005)*, London. Olivia Philip International consulting ltd
- Richard A (2012). FAQ on Deregulation of the Downstream Petroleum Sector and Removal of Fuel Subsidy. bizhallmark.com/index.php/feed/permalink/6557.txt
- Tosanwunmi O. (2012). Fuel Subsidy Removal or Deregulation: Evolving a Working Policy In Nigeria. <http://alphaedufoundation.org/>
- Ugorji E. (1995). Privatization/ Commercialization of State-owned Enterprises in Nigeria. Strategies for Improving the Performance of the Economy. *Comparative Political Studies*, 27(4), 537-560. <http://dx.doi.org/10.1177/0010414095027004003>
- Wikipedia (2011). <http://www.wikipedia.com>



This work is licensed under a [Creative Commons Attribution 3.0 License](https://creativecommons.org/licenses/by/3.0/).