



POLAC ECONOMIC REVIEW (PER)
DEPARTMENT OF ECONOMICS AND MANAGEMENT SCIENCE
NIGERIA POLICE ACADEMY, KANO



THE LONG-RUN AND SHORT-RUN DYNAMICS OF PETROLEUM DOWNSTREAM DEREGULATION: AN ARDL APPROACH

Abdurrahman Bala Yusuf

Department of Economics, University of Maiduguri, Borno State Nigeria.

Shuaibu Muhammed

Department of Economics, Nigerian Army University Biu, Borno State Nigeria

Nitte Abner

Department of Economics, Federal College of Education, Osiele Abeokuta, Ogun State Nigeria

Abstract

This paper investigates the application of ARDL Technique to determine “The long-run and short-run dynamics of petroleum downstream deregulation Spanning the period 1991-2014: Secondary data were used and econometrics models were analyzed through the application of Augmented Dickey Fuller in testing the stationarity of the time series. Based on the findings of the study, the results of the unit root indicate that the variables have mixed degree of integration $I(0)$, $I(1)$; The bound test cointegration procedure revealed the presence of long-run relationship among the variables. The study revealed that Importation of refined premium motor spirit (IPMS) grossly affects the petroleum GDP of the economy negatively both in short and long run; the study therefore recommends total deregulation of the downstream sector must be gradually and consistently pursued to deliver maximum result to all stakeholders and the nation. While that is being pursued, adequate infrastructure, especially refineries should be put in place.

Keywords: Deregulation, Downstream, Long-Run and Short-Run Dynamics, GDP

Introduction

The Nigerian economy before independence in 1960s and early 1970s largely depends on the proceeds from agricultural sector. This is because the country is known for the production and exportation of cash crops like cocoa, rubber, ground/cashew nuts, palm etc. The country also earns substantial forex from the exportation of produce from its secondary sector that source its raw materials from the agricultural sector (Onipede (2003)). This however, changed when crude oil took center stage in the nation's export refinery – occasioned by unprecedented increase in global crude price in the early 1970's. The increase has considerable multiplier effect on the economy. On one hand, more foreign exchange, increase in capital expenditure and lifestyle. On the other hand, less attention was given to the agriculture and this led to increase in rural – urban migration which affected the rural farming population. The collapse or near collapse of the agricultural sector could be attributed

to the oil boom of the early 1970's. Consequent upon the collapse of crude oil price in the international oil market, the fragile nature of the nation's economy was exposed vis-vis economic policies (Blanchard & Giavazzi (2003)).

The petroleum industry is a key player in Nigeria's economy. The sector contributes about 98% to the economic growth; activities in this sector include exploration, exploitation and distribution (Onipede (2003)). The distribution aspect can be decomposed into two for the purpose of illustration; to include “internal and external”. The internal distribution involves streamlined distribution of crude oil to the four refineries in Nigeria. The other involves exportation of crude oil from Nigeria to other parts of the world. The exportation angle can also be classified into two; the first involve outright sale of the product to trading parties and or export with a view to refine

and import refined product into the country.(Katz, & Rosen (1994).

Crude oil, aside from its commonly known by-products like Petroleum, Kerosene, and Diesel etc has other commercially viable by-product some of which include jet fuel, liquefied petroleum gas (LPG), bio fuels etc. These products are visible opportunity cost of refining crude oil from abroad. Crude production and exportation is one of the functions performed by the downstream sub-sector of the petroleum industry. Its other responsibilities include refining and distribution to deport across the country. Each of these activities has the capacity to provide employment as well as revenue to the government (Onipede (2003). However, as government parastatal, its operation is tied to government dictates. Most often contrary to the spirit of capitalism.(free market) which posit that government role in business activities if at all necessary should be minimal. Thus, thorough regulation of the petroleum industry by the government had adverse consequences on the economy. This is because the policy has direct effect on the economic conditions by way of hikes in transport fare, prices of goods and services, closure of local industries and job losses and unemployment (Adelabu, 2012).In spite of the Nigerian's position in the Organisation of Petroleum Exporting Countries (OPEC) as the major exporter of crude oil in Africa and six (6) exporter of oil in OPEC, the supply of petroleum product (PMS) has been the major concern of its citizens. Over the years, hardly would Nigerians live-out full calendar year without one form of fuel crisis or the other, while many social and economic commentators attributes to the regulation activities in the downstream oil subsector (Okafor Loretta (2012). The result is likely the re-occurrence of petroleum product induced socio-economic problems often witnessed in the country. In this regard, many Nigerians home and abroad suggest deregulating the industry. Deregulation in this context entails withdrawal of right of protection hitherto been the exclusive preserve of the government with regards to production and distribution of refined products. It is also the removal of regulation or control which includes removal of right to fix prices and monopoly right over certain issues. In the case of petroleum industry, deregulation is the removal of monopoly

right over production, distribution and pricing of refined petroleum product. The intention was to allow other interest groups to participate in the economic activities of the industry. Partial or total deregulation will remove government monopolies as well as promoting the efficiency between the interplay of the market forces (demand and supply). It will also moderate if not totally remove cost of subsidising petroleum product (Adelabu, 2012).In view of this, this study would examine the Long-Run and Short-Run Dynamics of Petroleum Downstream Deregulation.

Statement of the Problem

Despite the nation's huge endowment of crude oil and the extensive infrastructures available in the sector for distribution and marketing of petroleum products, the downstream subsector has been hit by increase instability, hallmarked by inadequacyof the product supply. These have led to the massive importation of petroleum products and price hikes in Nigeria.

In a bid to solve these problems, structural reform of petroleum industry become a critical component of macroeconomic liberalisation policy of government. Thus, the government role in the petroleum sector has been redefined with a view to deregulating the industry. Good as the policy may look, its objectives to some extent have not been achieved; thisis as a result of continuous increase in petroleum prices coupled with persistent scarcity of the product. It was expected that deregulation would give room for competition which would transform to price reduction and excellent supply and distribution network. However, reality on ground seems to suggest the opposite.

Though quite a lot of studies have been carried out on the subject matter, Sabi'u& Reza, (2014); Nkechi, (2013); Ehinimen and Adeleke, (2012); Ani (2014); Baghebo and Beauty (2015); Monday (2016), worked on the impact of deregulation of the downstream oil subsector with a particular interest on Dual Purpose Kerosene (DPK), also known as Household Kerosene (HHK). Automotive Gas Oil or Diesel (AGO) and other key macroeconomic indicators in a multivariate frame work using time series data. This study therefore, focused on the application of ARDL

technique in determining the long-run and short-run dynamics of petroleum downstream deregulation.

Literature Review

Conceptual Issues

From a global perspective, the theoretical argument behind the large scale deregulation reforms initiated in the late 1970s was two-fold. On one hand, deregulation reduces the rents that regulation creates for workers, incumbent producers, and service providers. This view is popular among academics and policy makers ever since the works by Stigler (1971), Posner (1974) and Peltzman (1976) contribute to the understanding of the political economy of regulation. It emphasise that deregulation allows competition on product, labour and capital markets to determine the winner of rent transfers. Thus, by spurring productivity and efficiency gains (Winston, 1993), economic deregulation ultimately contributes to the overall increase in economic growth.

The additional growth from deregulation manifest through increased employment and real wages (Blanchard and Giavazzi, 2003), which impacts both production and consumption and through increased investment this also affects the capital stock in the economy. However, a need for caution is required on the recent take on the efficiency gains from deregulation in the developing world. The main argument in this new area of literature was that deregulation reforms influence diverse economies differently, depending on their technology level and their quality of institutions. For example, Waterson, Michael, (2003): Weingast, Barry (2006) claimed that certain restrictions on competition may benefit the technologically backward countries, while Zerbe, Richard and McCurdy (2000) argued that the ideal regulatory policies in developed and in developing countries are different because of differences in the overall institutional quality in those countries.

In addition, Varian, (2007) used industry level data to demonstrate that within each economy, institutional reforms influence different industries differently, and more specifically, industries closer to the technology frontier would be affected more by deregulation and would innovate more than backward industries in order to prevent entry. As a result, countries closer to

the technology frontier would benefit more from deregulation. The benefits of economic deregulation in many industries prompted a debate on the growth effects of specific types of reforms on petroleum product and downstream deregulation.

Having seen what deregulation means, therefore deregulation of downstream oil subsector was the opening of the sector for competitors where players are to participate at every segment of the value chain and the removal of entry barriers in the supply and distribution of petroleum products. The PPPRA (2011) submits that deregulation of the downstream sector means opening up of the downstream sector of the petroleum industry to competition among all players in the industry. It means allowing every player the opportunity to refine or import petroleum products for use in the country as long as the product refined or imported meet quality specification. Igbikiowubo (2011) define deregulation of the downstream sector to mean loosening the tight rules governing the administration of the downstream sector by opening up the sector to competitors among all players in the industry. It means ensuring that every aspect of production, refining, distribution and dispensing of petroleum products is self-financing. Deregulation therefore involves competitive pricing of products.

Downstream oil deregulation indicates the omission of regulation on prices of petroleum products by the government allowing the forces of demand and supply to determine prices which also put aside the issue of subsidy and enhance competition, effectiveness and optimize the productivity in the petroleum industry (Umoru 2001). This means that deregulating the oil industry assumes market forces as the determinant of prices of petroleum products instead of a decision to control price by regulatory body. Hence deregulating the downstream oil subsector will means an improvement in competitive service delivery that will allow end users to have various options to choose from in their pursuit for satisfaction. However, according to Onipede (2003), the constant immeasurable conduct by most of the government parastatal were the inevitable proof of unfit of the government engagement in business.

Different Perspective on Downstream Oil Deregulation

Many have offered different perspectives and motives for the government deregulation of the downstream oil subsector in Nigeria, yielding different opinions and two schools of thought. Those supporting deregulation argue that deregulation of the downstream petroleum industry would help government to eradicate fuel scarcity and ensure constant fuel supply across the country (Funsho, 2005). Deregulation of the industry would create an inflow of foreign investment while persistent smuggling of petroleum products and inefficiencies in the sector will be eliminated (Oluwole, 2004). They also posit that Nigeria is among the countries that have the lowest price of petroleum products in the world and with deregulation, the international market equilibrium would allow government to channel funds to other sectors of the economy. Furthermore, they argue that it would break the monopoly enjoyed by the Nigerian National Petroleum Corporation (NNPC) (Okafor, 2012).

Essentially, deregulation would lead to the uninterrupted operation of the refineries and would also guarantee a steady supply by enabling stakeholders and independent marketers to participate in product importation and marketing (Enemoh, 2004). Their views were also that the regulated regime by way of subsidy was a way of the government enriching few petroleum products marketers (Oluwole, 2004). Abu (2012) indicate that Nigerians believed deregulation and privatization will usher in sustainable development and would be a blessing rather than a curse. Odey (2011) recommend the complete deregulation of the downstream sector to reduce corruption, inaccurate record keeping, inefficiency, smuggling and insufficient product supply. Jean (2012) suggested that making deregulation work involves providing an enabling environment and framework for efficient production, supply and distribution. Braide (2003) recommended that business as usual in NNPC under regulation by way of product importation and distribution was inappropriate because it represents a wrong step for government to continue with; instead the government should fully deregulate the downstream oil subsector. The opposing group argues that Nigerian petroleum industry must not be deregulated completely; instead the government should maintain the status quo and

restructure the sector to improve efficiency for the overall national interest. They opined that the root cause and clamour for deregulation was because of the massive corruption in the sector and therefore this should be tackled rather than embarking on deregulation. They further argue that deregulation helps increase profit margins for the importers; interestingly this was the position of the labour union and the organised civil society. Furthermore, Amana and Amana (2011) asserted that the fair distribution of economic benefits derived from petroleum has proven elusive and therefore predicts same for deregulation. Ibanga (2011) argued that removal of subsidy may cause dislocation to the price of premium motor spirit (PMS) because of its high demand and inadequate supply. Bafor (2001) doubt government sustaining the gains of deregulation due to the undue interference in NNPC's affairs, resulting to near collapse and dismal performances which encouraged the clamour for privatization and deregulation.

According to Kikeri and Nellis (2004) deregulation processes and institutions must be combined with appropriate competition policies and regulatory frameworks without which the gains of deregulation can be eroded by the harsh impact on consumers and the overall economy will be affected due to inadequate product supply. Matthew and Fidelis (2003) opined that the merit of deregulation can only be enjoyed by Nigerians if only there will be genuine attention to eliminating corruption in the sector. Adagba, Ugwu and Eme (2012) posited that government was merely taxing the poor to subsidise the life of the rich. Similarly, Akpanuko and Ayandele (2012) argued that government was not transparent in its drive to transform the economy and suggested reduction in the cost of governance and rehabilitating the refineries as a measure to drive the economy.

Empirical Review

Monday, Olowookere and Muritala (2016) Downstream oil deregulation and Nigerian economy have found that increase in price of petroleum products and inflation were not as a result of deregulation, and deregulating price of petroleum product significantly influence economic growth with marginal inflation. Muritala and Taiwo (2012) found that Crude oil prices have significant influence on the

growth of the Nigeria economy. Stavros Degiannakis, George Filis, Christos Floros (2011) have executed their research on the Dynamic correlation between stock market and oil prices: The case of oil importing and exporting countries. The contemporaneous correlation results show that the correlation increases positively in response to important aggregate demand-side oil price shocks, which are caused due to global business cycle fluctuations. Nkechi. (2013) Reveals that deregulation of the downstream oil sector was a good policy only if the existing refineries have been resuscitated through commercialization to ensure a fair and stable price of the product as well as its availability.

Michael and Baghebo (2015) investigated the performance of the downstream petroleum sector over the years and its impact on economic growth in Nigeria and found out that all the macroeconomic variables (OR, NOR, FDI, CONSUMPT) are positive and statistically significant on real GDP. Ani, Ugwunta, Oliver and Eneje, (2014) investigated the causal relationship between oil price volatility and key macroeconomic variables in Nigeria in a multivariate framework using time series data and found out that there was a positive but insignificant relationship between oil price and the Nigerian Gross Domestic Product. Christopher and Adepoju (2012) assessed the distribution of petroleum products in Nigeria and recommend that the downstream activities of the industry completely deregulated to allow private sector drive effectiveness and hence bring down operation cost that will consequently reduce price.

Sabiu and Reza (2014) employ Vector Auto regression Model using Variance Decomposition, Impulse response function and Granger causality test to assess the effect of deregulation of downstream oil sector on some macroeconomic variables. Their result showed that changes in oil prices due to deregulation are the major source of variation in GDP and unemployment in Nigeria. The granger causality test indicates unidirectional causality running from petroleum prices to GDP. The research result of Kargi, B., (2014), revealed that oil price increase doesn't granger cause the economic growth whereas decrease causes it.

Theoretical Framework

There are two broad traditions with respect to the economic theories of regulation. The first tradition assumes that regulators have sufficient information and enforcement powers to effectively promote the public interest. This tradition also assumes that regulators are benevolent and aim to pursue the public interest. Economic theories that proceed from these assumptions are therefore often called 'public interest theories of regulation'. Another tradition in the economic studies of regulation proceeds from different assumptions. Regulators do not have sufficient information with respect to cost, demand, quality and other dimensions of firm behaviour. They can therefore only imperfectly, if at all, promote the public interest when controlling firms or societal activities. Within this tradition, these information, monitoring and enforcement costs also apply to other economic agents, such as legislators, voters or consumers. And, more importantly, it is generally assumed that all economic agents pursue their own interest, which may or may not include elements of the public interest. Under these assumptions there is no reason to conclude that regulation will promote the public interest. The differences in objectives of economic agents and the costs involved in the interaction between them may effectively make it possible for some of the agents to pursue their own interests, perhaps at the cost of the public interest. Economic theories that proceed from these latter assumptions are therefore often called 'private interest theories of regulation'. Fundamental to public interest theories are market failures and efficient government intervention. According to these theories, regulation increases social welfare. Private interest theories explain regulation from interest group behaviour. Transfers of wealth to the more effective interest groups often also decrease social welfare. Interest groups can be firms, consumers or consumer groups, regulators or their staff, legislators, unions and more. The private interest theories of regulation therefore overlap with a number of theories in the field of public choice and thus turn effectively into theories of political actions. Depending on the efficiency of the political process, social welfare either increases or decreases. Important changes have taken place in the regulation of fundamental sectors of the economy such as electricity and gas, electronic

communications, water and sewerage, postal services and transport (airports and airlines). The services provided by the sectors are often essential for both businesses and consumers. Interruption in the supply of these services will put a halt to economic activities, bring a stop to interactions taking place in society at large and these interruptions may thus present risks to life and health.

Neoclassical Theory

This study reviewed attempts made by economic researchers to exploit some common explanations on deregulation. The study premised on neoclassical Theory as a theoretical framework. The concept of deregulation was based on the neoclassical school of thought. It was based on the doctrine of competition and profit motive founded on free market pricing and freedom from interfering hands of state regulation.

Deregulation according to this theory is reaping the advantage of market system and competition, namely; effectiveness, productivity and efficient service delivery. Privatization will thus, strengthen market forces with some degree of deregulation, economic liberalization, relaxation of wages and price controls (Ugorji 1995). It is derived from international capitalist position, especially the World Bank/International Monetary Fund which stipulated economic liberalisation/privatization as pre-conditions for providing development loans to the less developed countries.

The deregulation policy has globally been embraced by several countries, in order to lessen public sector dominance and for developing liberalised market while ensuring adequate supply of products such as the story of Peru, Argentina, Pakistan, Chilean, Philippines, Thailand, Mexico, Canada, Venezuela, Japan and USA. All of which dismantled their state owned oil companies for a significant turning point in the success story of their oil industry reform efforts. (Loretta 2004).

Neoclassical theory to the deregulation of the downstream oil sector of Nigerian economy heralds that the Nigerian government should stop regulating the price of fuel and allow the market to fix the price. The essence is to ensure that the government no longer spends the huge amount of money it does in

subsidizing the fuel for the Nigerian masses. According to Izeze (2013), quoting the federal government the country's economy would be truncated if the full deregulation of the downstream sector of the petroleum industry is not carried out. This move becomes quiet essential because, according to Umeano (2011), statistics from the PPPRA reveals that as at August 15, 2014. The landing cost of a litre of petrol was N 119.21, the margin for transporters and marketers was N 15.49 the expected pump price is N 220.7 while the official pump price was N 97 per litre this shows that the Federal Government spends N 123.70 as subsidy on each litre of petroleum consumed in Nigeria with about 45 Millionlitres consumed daily. It means the country spends 5.66 billion as subsidy every day.39.62 billion per week and 158.48 billion monthly. According to the presidential letter, a major component of the policy of fiscal consolidation is government's intent to phase out the fuel subsidy beginning from next fiscal year 2016.

It should be understood that this quest is only to complete the exercise, as the first phase was carried out on 1st January 2012. The insistence from the government to continue this exercise is said to be born out of the current administration's avowed commitment to western neoclassical ideas which openly requests all governments to deregulate and privatize their publicly or government owned organizations to enable competition which will in turn generated success.

The term "neoclassical" was originally coined in 1900 by Thorstenin Veblen in his article 'preconception of economics science' in which he related marginalists in the tradition of Alfred Marshal and later used by John Hicks, George Stigler and others. He defined the concept of neoclassical economics as "the priority of the price mechanism, the free enterprise, the system of competition and a strong and impartial state." The underscoring tenets of neoclassical are sound macroeconomic policy, trade liberalization, Labour market flexibility, privatization, deregulation and export oriented sectorial policies. However, laudable it may sound in the orifice of the proponents, this theory has always been kicked against even in the USA where it was promulgated and propagated

(Obasi, 1999). Same also applies in Nigeria as many scholars have questioned the tenability of deregulation to save the country from truncation because they see corruption in the oil sector as the monster and not subsidy, as subsidy was a way of giving back to the populace who has little or no gain from the common wealth of the nation oil.

The opponents of neoclassical argue that liberalization subvert nations' ability for self-determination. They further posited that neoclassical economics promote exploitation and thus have negative economic consequences such as inequality. It benefits the upper classes over the lower classes (Okeke, 2001), just as Onyishi et al (2012), Izeze (2013), Ovaga (2012), Umeano (2011) etc. had criticizes the deregulation of the downstream oil sector in the context of fuel subsidy removal. But just like Jonathan Administration, even when the house of assembly advised the President to rescind his moves on deregulation as it is considered anti-mass hence the mass protest from all quarters, he refused and instead embarked on partial subsidy removal and promised a full scale deregulation by 2013. A move he had started already only to be stopped temporarily however by the court verdict.

The Supreme Court sitting in Abuja on March 19, 2013 declares oil sector deregulation illegal. A judgment, many human right activists and civil society organizations and the entire masses applauded, leading to the critical question Umeano (2011) ask "whose interest was the president protecting", perhaps by insisting on deregulation even when the entire country rejects it? A question that prompted another question- how reliable and valid is the neoclassical theory especially to the Nigerian situation? The appropriateness of the neoclassical to this study deregulation of the petroleum downstream subsector and Nigeria's economic growth lies in its ability to answer the two questions raised, and explain the government's avid intention to regulate, and the masses protestations for resistance of the policy. It clearly shows whose interest the president is protecting (IMF, World Bank, friends and cronies who are the sacred cows that are untouchable). The theory (neoclassical) fundamentally, recognizes the importance of deregulating the sector but did not

explain what happens when neoclassical system gets corrupt as may be the case of Nigeria. But if most fundamentally, recognizes the right of the people to protest. But the real question which the study focuses to answer – who feels the impact of this deregulation- the theory did not answer, even though it recognized that people will feel pinged by the deregulation, which may be why Jonathan and his predecessors have blindly sought to implement the policy without recourse to who bears the brunt. Besides, whatever the reason they may give, there is no one best way to solve a problem. Economists recognized this and espoused alternatives and choices. But Jonathan had said that it is only full deregulation or the nation's economy truncates (Agboyi, 2009).

Furthermore, economic theories suggest that subsidies are inefficient because, in the absence of market imperfections and with convex indifference curves, the value of the subsidy to the consumer will be less than its cost to the government (Katz and Rosen, 1994). In other words, consumers do not use resources optimally. If prices were increased to reflect commercial costs and subsidy was returned to consumers in cash, they would be on a higher indifference curve, and would be consuming less petroleum products (because relative prices have changed) and more of other normal goods. Economists argue that income transfers are superior to subsidies and reduce inefficiencies, as the former do not create the deadweight loss associated with subsidies and maximize welfare. Economic theory says that social welfare is maximized when the price of each good and service is determined by the intersection of producers' willingness to supply and consumers' willingness to pay. When the price deviates from this point of static equilibrium, resource allocation is inefficient since the benefit to consumers from the last unit of energy consumed are smaller than the costs involved in supplying the energy service (Manzoor et al., 2009).

Methodology

Method of Data Analysis

Secondary data were used and content analysis of government policy document related to petroleum industry were analysed. The Auto-regressive Distributed Lagged Estimates (ARDL) were used for

the analyses, because ARDL technique possessed the following advantages; it does not formally require pretesting of unit root, more so, using ARDL, both short run and long run coefficient can be obtained simultaneously, and it can be applied to variables irrespective of their order of integration whether they are purely I(0) and I(1) or mixed, it is efficient for limited sample data between 20 and 80 observations and large sample (Pesaran & Shin, 1997 & 2001).

ADF Test for Unit Root

The ADF specification with order 1 is given as:

$$\Delta\gamma_t = \alpha + \rho\gamma_t + \delta\Delta\gamma_{t-1} + \rho\gamma_{t-2} + \rho\gamma_{t-3} + \rho\gamma_{t-4} + \mu_t \dots\dots\dots 1$$

Where:

Δ = difference operator, γ_t = dependent variable, μ_t = white noise.

The stationarity test for each of the series is thus given as follows:

$$\Delta GDP_t = \gamma GDP_{t-1} + \alpha_{2t} + \sum_{t-1}^p \beta \Delta GDP_{t-1} + \mu_t \dots\dots\dots 2$$

$$\Delta PMSP_t = \gamma PMSP_{t-1} + \alpha_{2t} + \sum_{t-1}^p \beta \Delta PMSP_{t-1} + \mu_t \dots\dots\dots 3$$

$$\Delta PMSC_t = \gamma PMSC_{t-1} + \alpha_{2t} + \sum_{t-1}^p \beta \Delta PMSC_{t-1} + \mu_t \dots\dots\dots 4$$

$$\Delta IPMS_t = \gamma IPMS_{t-1} + \alpha_{2t} + \sum_{t-1}^p \beta \Delta IPMS_{t-1} + \mu_t \dots\dots\dots 5$$

$$\Delta PPMS_t = \gamma PPMS_{t-1} + \alpha_{2t} + \sum_{t-1}^p \beta \Delta PPMS_{t-1} + \mu_t \dots\dots\dots 6$$

Model Specification

ARDL Approach to Regression

The variables operationalization of the model estimating the impact of deregulating petroleum downstream subsector and Nigeria's economic growth was obtained from the neo-classical theory as postulated in the theoretical framework. The theory portrays regulation policy, PMS scarcity, hikes in price and subsidy payment has increases Nigeria's external debt profile, decrease foreign reserve, increase fiscal burden has adversely affects economic growth.

The study employed the following variables; quantity of premium motor spirit produced per litre (PMSP),

Financial data that are highly volatile are likely to be non-stationary at levels. Thus, the attempt to regress a non-stationary series on another non stationary series leads to spurious regression (Granger & Newbold, 1974), a situation that causes wrong inference making. Thus, since correct inference will depend on statistical properties of the data, particularly stationarity, a unit root test was conducted on the time series (PGDP, PMSP, PMSC, IPMS, PPMS) using ADF test (with a constant and time trend) for a sample period of 1991-2014.

quantity of premium motor spirit consumed per litre (PMSC), quantity of premium motor spirit imported per litre (IPMS), and price of premium motor spirit per litre (PPMS) as the independent (explanatory) variables to measure the impact of downstream oil deregulation while petroleum Gross Domestic Product (PGDP) as dependent (explained) variable to measure the performance of the economic growth. Here, petroleum Gross Domestic Product (PGDP) was proxy for the level of economic activities.

The functional form of the model for the study is specified as follows:

$$PGDP = F (PMSP, PMSC, IPMS \text{ and } PPMS) \dots\dots\dots 7$$

Adopting a log-linear specification and assuming linearity among variables in order to removed serial

Table 2 present the result of the first estimation of equation 7 from microfit of Muhammad Hashem Pesaran and Pesaran (1997). The essence is to establish the presence of long-run relationship among the variables in the model. The coefficients of the long-run values, presented by the level variables in the equation are subjected to joint significant test to establish the presence of cointegrating relationship. As presented in table 2, the coefficient of the lag-dependent; PGDP (-2) is negative, significant and less than one, satisfying one important criterion for long-

Table 2: Result from the ARDL OLS Estimation

Regressor	Coefficient	Standard Error	T-Ratio	[Prob]
PGDP(-1)	.055909	.11883	.47050	0.649
PGDP(-2)	-.43444***	.11984	-3.6252	0.006
PMSP	.18003**	.086499	2.0813	0.067
PMSP(-1)	.063100	.077510	.81409	0.437
PMSP(-2)	.36461***	.083840	4.3488	0.002
PMSC	-.75844***	.15196	-4.9911	0.001
PMSC(-1)	1.6811***	.15922	10.5588	0.000
PMSC(-2)	-1.0111***	.18302	-5.5246	0.000
IPMS	-.20835	.12680	-1.6432	0.135
PPMS	-.66917***	.19220	-3.4817	0.007
PPMS(-1)	1.1025***	.13405	8.2245	0.000
C	6.0073	6.7123	.89497	0.394
TREND	.25333***	.032775	7.7293	0.000
R-Squared	.99472	R-Bar-Squared	.98769	
DW-statistic	2.1619	F-stat.	141.4202	0.000

Diagnostic Tests

Serial Correlation	1.2025	0.273	Functional Form	13.5123***	0.000
Normality	2.9766	0.226			

Note: ***, ** denotes significant at 1%, 5% level respectively

To arrive at the long-run and short-run coefficient, we apply the general to specific procedure to trim values that are not significant one after the other according to their order of magnitude. The result is presented in table 3. The result shows that downstream petroleum deregulation has significantly and positively influences Nigeria's

run estimation. PGDP (-2) being -0.43444***, signifies the presence of long-run relationship in the model.

Furthermore, the results from the ARDL estimate with null hypothesis in favour of joint significant of the estimates are rejected at 5% level with the corresponding F-statistics of 141.4***, this value is jointly and statistically significant and therefore confirmed the presence of long-run relationship among the variables.

economic growth with the impact elasticity of 0.44086 meaning that the deregulation exercise positively affects Nigeria's economic growth more than the period prior to the exercise. Also the domestic price of PMS is found to influence domestic production of refined PMS both in short-run and long-run.

Table 3: Estimated Long-run Coefficient of the ARDL

Regressor	Coefficient	Standard Error	T-Ratio	Prob
PMSP	.44086***	.10711	4.1158	0.003
PMSC	-.064143	.17132	-.37441	0.717
IPMS	-.15114	.095645	-1.5802	0.149
PPMS	.31435**	.11791	2.6659	0.026
C	4.3578	4.8519	.89816	0.392
TREND	.18376 ***	.016146	11.3813	0.000

Note: ***,** denotes significant at 1%, 5% level respectively

Summary of the Findings and Policy Implications

The empirical test results show that deregulation of the downstream petroleum subsector in Nigeria has brought a mixed impact on petroleum GDP in Nigeria. The study uses the bound testing (ARDL) approach to cointegration to examine the long-run and short-run relationship between the determinants of petroleum downstream deregulation (proxy by price of premium motor spirit holding other variables constant) and Nigeria's economic growth (Proxy by Petroleum Gross Domestic Product). At the onset unit root test for stationarity was conducted on the variables to identify their order of integration. This is because the employed ARDL approach cannot estimate a non-stationary series of order more than one. The bound test cointegration procedure revealed the presence of long-run relationship among the variables. Using general-to-specific approach, the coefficient of the long-run estimate are obtained. The final result showed that downstream oil deregulation exercise significantly influences Nigeria's economic growth.

Conclusion

From the discussion so far, it was clear that the current state of the deregulation of the downstream petroleum Sub-sector is adjudged as inefficient in

service delivery and ineffective at promoting national developmental objectives.

One of the main finding emerging from this study indicates that deregulation of the downstream petroleum subsector in Nigeria does not lower price and made availability of the product in the short run but has impact on the price of premium motor spirit at 5 percent level of significant in the long run. Hence, it can be concluded that underutilisation of refineries constitutes major setback in reaping the benefit of deregulation. This is at variance with the hypothesis that deregulation leads to lower or zero benefit.(i.e. the null hypothesis that says there is no significant long-run relationship between petroleum GDP and downstream petroleum deregulation is rejected).

Recommendations

The study recommends total deregulation of the downstream sector must be gradually and consistently pursued to deliver maximum result to all stakeholders and the nation. Ensuring that the four refineries established in Nigeria are maintained and made to operate at full capacity.

Reference

- Abu, I.N. (2012)"Deregulation and Privatization of the Upstream and Downstream Oil and Gas Industry in Nigeria: Curse or Blessing?" *International Journal of Business Administration*.Vol.3, No1: January 2012.
- 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) Vol. 1, No.7; February 2012
- Adelabu, N. S. (2012). 'The political economy of oil deregulation in Nigeria's fourth Republic: Prospects and challenges'. *Journal of Emerging Trends in Educational Research and Policy Studies* 3(3), 193-198
- Agboyi, T., (2009). Fuel at #100 Per Litre. *The Nigerian Punch*, Nigeria, Lagos, pp:13
- Amana, A.R & Amana S.A (2011), "Oil Product Price Deregulation and National Development in

- Nigeria" *Pakistan Journal of Social Sciences* 8 (6): 294- 300, 2011.
- Ani, W., Ugwunta, D., Oliver, I. & Eneje, B., (2014) Oil price volatility and economic development: stylized evidence in Nigeria, *Journal of economics and international finance*, vol.6(6), pp125-133.
- Anyadikekechi. O (2013) Assessment of the implication of full scale deregulation of the downstream oil sector on the Nigerian economy: the neoliberalism approach.
- Blanchard, O. & F. Giavazzi (2003), Macroeconomic effects of regulation and deregulation in goods and labour markets, *Quarterly Journal of economics*: 879-906
- Braide, K. M. (2003), Modes of Deregulation in the Downstream Sector of Nigerian petroleum industry. Nigeria: Port Harcourt.
- Central Bank of Nigeria. (2014). Annual Statistics Budgeting Reports: Public Finance Statistics Published 02/08/14/151521pdficon
- Christopher Ehinomen and Adepoju Adeleke (2012) An assessment of the distribution of Petroleum products in Nigeria. *E3 Journal of Business Management and Economics* Vol. 3(6). pp. 232-241, June, 2012 Available online <http://www.e3journals.org>
- Engle, R.F. and C.W.J. Granger (1987), .Cointegration and Error Correction *global journal of political science and administration* vol.1, no.2, pp.23-48.
- Granger, C.W.J & Newbold, P., (1974). Spurious Regression in Econometrics: *Journal of Econometrics* 2(1), 111-120. <http://ppmc.nnpcgroup.com> retrieved on 05/10/2016 06:50am <http://www.total.com.ng/our-fuels/fuel-prices.html> retrieved 06:13 05/10/2016. <https://dpr.gov.ng/index/nigeria-saves-n1-4-trillion-from-subsidy-removal/#sthash.2HW7vbMs.dpuf>
- Igbikiowubo, H., (2011). "Nigeria's Unending Flirtation with Deregulation". *Sweet Crude*, October.
- Izeze, I., (2013). Oil: Downstream Deregulation or Jonathan's Continuing Irresolution? <http://saharareporters.com>
- Izibili, M.A. & Aiya, F., (2007). 'Deregulation and Corruption in Nigeria: An ethical response'. *Journal of social science* 14(3), 229-234
- Kachukwu (2016) New Framework for Petroleum Products Supply, Distribution and Pricing – May 2016
- Kargi, Bilal (2014) : The Effects of Oil Prices On Inflation and Growth: Time Series Analysis In Turkish Economy For 1988:01-2013:04 Period, *International Journal of Economics and Research*, Vol. 5(2), 29-36
- Katz, M.L., Rosen, H.S. (1994), *Microeconomics* (2nd ed) Sydney: Irwin
- Kikeri, S., & Nellis, J. (2004), An assessment of privatisation, *the World Bank*
- Kupolokun, F. (2005). —Liberalization: The experience of the Nigerian Petroleum Sector. *Alexanders Gas and Oil Connections*, 10(2).
- Manzoor, D., Shahmoradi, A., Hagigi, I. (2009), *An analysis of Energy Reform: A CGE Approach*. Imam Sadiq University and Ministry of Energy, Iran
- Michael Baghebo & Timothy Okule Atima (2015). The impact of petroleum on economic growth in Nigeria. *Global Business and Economics Research Journal* Vol. 2 (5): 102 - 115
- Monday, J.U., Ekperiware, M. C. & Muritala, B.R., (2016). Downstream oil deregulation and Nigerian economy, *ECOFORUM*, vol 5, Issue 1(8).
- Muritala Taiwo, Abayomi Taiwo, Damilare Olowookere (2012). Crude oil price, stock price and some selected macroeconomic indicators: implications on the growth of Nigerian economy. *Journals of finance and accounting* vol.3(2). 2222-2847
- Obasi, I. N., (1999). *Research Methodology in Political Science*. Enugu: Academic Publishing Company.
- Okafor Loretta (2012) Deregulation of the Nigerian downstream oil sector; keeping faith with a global trend. <http://www.pppra-nigeria.org/article/details.asp?ArticleID=16>
- Okeke, C. C., (2001). Foundations of Educational and Behavioural Research: Issues and Methodology. Enugu: Academic Publishing Company.
- Olawale et al (2004) "The Politics and Policies of Oil Deregulation in Nigeria: Implications and Policy Suggestion.
- Onipede, S., (2003). Towards creating an environment for sustainable economic growth in Nigeria, international experience [online] available from <http://www.nigerdeltacongress.com/tarticles/towards_creating_an_environment.htm> [13 November 2012]
- Onyishi, A.O, Eme, I.O. & Emeh, I.E.J. (2012) the Domestic and International Implications of Fuel Subsidy Removal Crisis in Nigeria.

- Kuwait chapter of *Arabian Journal of Business and Management Review (AJBMR)* Vol.1, No. 6, February Edition, pp.57 -80.
www.arabianJBMR.com
- Ovaga, O. H., (2012). Subsidy in the Downstream Oil Sector and the Fate of the Masses in Nigeria. *Arabian Journal of Business and Management Review (AJBMR)* Vol.1, No.6 January Edition, Pp.77-90.
- Peltzman, Sam (1976), 'Towards a More General Theory of Regulation', 19 *Journal of Law and Economics*, 211-240.
- Pesaran M. H. & Pesaran B., (1997). *Working with Microfit 4.0: Interactive Econometric Analysis; [windows version]*: Oxford, Oxford University Press.
- Pesaran, M.H. and Y. Shin (1995), 'Long-Run Structural Modelling', *un-*
- Pesaran, M.H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of
- Posner, Richard A. (1974), 'Theories of Economic Regulation', 5 *Bell Journal of Economics and Management Science*, 335-358.
- PPPRA. (2012). The Evolution of Petroleum Products Pricing and Regulatory Agency. [online]
- Vladimir, H. (2012), Masaryk University, Lipova 29 published manuscript, University of Cambridge.
- Representation: Estimation and Testing, *Econometrica*, 55: 251-276. research observer: *The International Bank for Reconstruction and Development*,
- Sabiu, B. S., & Reza, K., (2014). effect of the deregulation of downstream oil sector on the Gross Domestic Product (GDP) and employment in Nigeria, the macrotheme review 3(3).
- Stavros Degiannakis, George Filis, Christos Floros (2011) Dynamic correlation between stock market and oil prices: The case of oil-importing and oil-exporting countries.
- Stigler, G. J., (1971). 'The Theory of Economic Regulation', 2 *Bell Journal of Economics and Management Science*, 3-21.
- Ugorji, E.C., (1995). 'Privatization or commercialization of state-owned enterprises in Nigeria'. *Strategies for improving the performance of the economy comparative political studies* 7(4), 537-560
- Umeano, O., (2011). Deregulation of the Downstream Sector & Removal Of Subsidy In Oil As It Affects the Citizenry. Subsidy Removal: Whose Interest was the President
- Umoru, S., (2001). 'Deregulation not yet time'. *The Vanguard* 7 June, 18
- Varian, H.R. (2007), 'Measuring the Deadweight Costs of DUP and Rent Seeking Activities', *Journal of Economics and Politics*, 81-95. vol: 19, issue: 1, pp 87-118.
- Waterson, Michael (2003), The Role of Consumers in Competition and Competition Policy, *International Journal of Industrial Organization*, 129-150.
- Weingast, Barry (2006), 'Regulation, Reregulation, and Deregulation: The Political
- Winston, Clifford (1993), 'Economic Deregulation: Days of Reckoning for Microeconomists', 31(3) *Journal of Economic Literature*, 1263-1289.
- Zerbe, Richard O. and H. McCurdy (2000), The End of Market Failures, *Regulation*, 10-14.