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Trajectory of Oil and Gas and Economic Development: The Untold Tangential

Sharlywest Uwabor Eboigbe & Victor Usunobun Imagbe
University of Benin, Edo State, Nigeria

Abstract

The financing challenges of the oil and gas industry globally brings to fore the need for this paper. Hence, we want to know the quantitative and directional relationship between oil and gas proceeds and financing options placed side by side with other key aggregates economic indicators' impact on the national health using the Nigeria model. Using some statistical tools of analysis and review of legislative pronouncements, we discovered that oil and gas as well as its related product financing challenges are unique. Vesting of petroleum-related activities on the State according to all oil and gas-related Acts of parliament from Petroleum Act of 1969 to the Nigerian oil and gas industry content development act 2010 is detrimental to national economic survival. On the basis of these aforesaid, we therefore recommend that various stakeholders' interest should be integrated into the policy frameworks governing the operations of oil and gas in Nigeria. The passage of the Petroleum Industry Bill of 2011 with the legislative arm of the Nigerian government that incorporates the interest of host community into oil and gas financing will help weaken this unhealthy and unfruitful monopoly. We wish to advocate further the total removal of Government hegemony from the hydrocarbon industry operations for efficient service delivery, while the supervisory and regulatory functions should be for the government.

Keywords: Hydrocarbon Resources, Government Policy, Natural Resources, Savings and Capital Investment, Industry Policy

JEL Classification: Q35, Q48, P28, O16, O25

Paper Classification: Research Paper

Introduction

Even with an unimaginably high appetite for capital, oil and gas industry still have reasonably old-fashioned financial structure. The heightened political and economic uncertainty surrounding companies in this sector have driven investors in the industry to diversify various sources of funds for such capital intensive ventures. This lead to the shifting from solely bank-financed to non-bank through capital market-driven financing or bond market, private equity and export credit agencies, joint venture financing, project partnership, investment banking loans etc. Risk management profile coupled with the burden to generate suitable return led to tighten up

of lending rules and standards for financial institutions by global agencies saddled with such responsibilities (e.g. Basel Committee).

Global mobility of capital encouraged by effective financial sector development as well as various national infrastructural markets need which appears as a veritable ingredient for transmission of investible funds and its accessibility on a cross-border basis. This though heightens the competitiveness for these financing options as right conditions that attract investment based on risk-return relationship prevails. Political risk anchored on political instability slows down access to finance and investors' readiness to invest in innovative technologies in the sector. This in no doubt will impact negatively global oil and gas landscape in the foreseeable future.

Oil and gas are indispensable high-value products for technologically advanced and emerging nations. Oil and gas, for now, is the spindle for which human survivals revolves. This is justified by plethora of its usage as demonstrated below: industrial developments and products, machine technology and its operation as well as heating and cooking. The list also include been the fulcrum for the generation of electricity and petrochemical industry in the manufacturing of synthetic fibres, fine and heavy chemicals, fertilizers, pesticides, medicines, plastics, solvents and dyes. In the same way, oil and gas plays central role in economic evolution and development.

The features of high usefulness and value associated with oil and gas also made it an instrument of global conflict. This is because of the presence of oil and gas resources in large quantity consistently raises hopes and prospects of every citizens, local communities and household, governments and the aggregate economy as well as businesses involved in essential services delivery. As governments optimism for huge and reliable incomes to fund its budgets rise, citizens expectation for improved standards of living, local and surrounding communities anticipation for rapid development and modern facilities so also is the international oil companies high returns expectations on their huge investment outlays and risk. The optimisms and prospects from these authorities are tangled and twisted due to weak governance structures, lack of social cohesion resulting in tensions, and the biggest masquerade of corruption, which drives unending conflict, rebellion, insurgencies, and secessionism.

Are there sovereign nations heavily endowed with hydrocarbon deposit that is not a boiling pot occasioned by conflicts as today? Libya, Venezuela, Angola, Nigeria, Iran, Iraq, Russia, Sudan, South Sudan to mention but few with the exception of Canada are all at various levels of crises powered by hydrocarbon abundance and infrastructural underdevelopment fuelled by institutional bribery and corruption. One will not be wrong to aver that the primary reason for absolute peace and progressive economic fortune of Western Europe is predicated on the near absence of these hydrocarbon resources. Nigerian governance loss of creativity and economic innovativeness is not unconnected with the discovery of this black gold in large quantities. The lack of extended manufacturing capacity is tailing off intensely and speedily due to challenges occasioned by global oil and gas price volatility, slim balances between demand and supply, technological advancement in the search for alternatives to energy sources. Also of essence is due to substantial capital-intensive nature of oil and gas investment, there exist the difficulty for management to project future returns with precision.

Disappointingly, these aforementioned challenges convey industry-wide decisions error-prone returns valuation techniques. The axiom that a rise in oil prices is the principals deteriorating force to oil-importing countries terms of trade through the erosion of her national purchasing power (Dohner, 1981). Regrettably, it translates to the transfer of oil-importing countries wealth to their oil-exporting counterpart (Abeysinghe, 2001). It is shamefully correct to assert therefore that the net consequence of oil shocks to oil-importing countries is contingent upon their exporting

partners' expenditure framework and trade preferences. With a view to aligning with trading partners' position, dislocated resources (e.g. labour and capital) are reallocated across various sector to cushion the effect of the shocks powered by oil price unpredictability. This distorts unemployment position on the long-run (Loungani, 1986).

Therefore, the confluence of projects affordability and accessibility to funding, environmental friendliness and sustainability of returns on investment remain a fundamental issue. Similarly, as micro and macroclimate financing interacting on the long run also determine investment success measured by the financial wellness of the business entity. These are the motivation for this study as we seek to know the quantitative and directional relationship between oil and gas proceeds from financing options and other kill aggregate economic forces impact on the national health and living standard of the citizens. The distressed nexus between oil production, dwindling economic and political performance in midst of huge oil proceeds failed to correct an astonishing rates of poverty in the nation as they are undeniably linked to corruption and political friction. The challenges facing Nigeria oil and gas operation are dissimilar and many. Ranging from bunch of criminals and hooligans damaging oil and gas installations and bunkering. Political interference, various anti-progressive legislative oil and gas enactment, energy policies and regulatory summersault that inhibits growth are astronomic. These selfish legislative pronouncement within concessionary and contractual agreements were put ordinarily to define the privileges and responsibilities of host governments and investors (Tordo, 2007). The exclusion of the host communities from these enactments, who are the eventual recipient of the various negative externalities will inevitably be the last straw that will hit the camel's back. A cursory look the Petroleum Act of 1969 reveal the legislative strength for oil and gas failure vis-à-vis its financing options.

'An Act to provide for the exploration of petroleum from the territorial waters and the continental shelf of Nigeria and to vest the ownership of, and all on-shore and off-shore revenue from petroleum resources derivable therefrom in the Federal Government and for all other matters incidental thereto'

1. Vesting of petroleum in the State. The acts read thus: (1) The entire ownership and control of all petroleum in, under or upon any lands to which this section applies shall be vested in the State. (2) This section applies to all land (including land covered by water) which- (a) Is in Nigeria, or (b) Is under the territorial waters of Nigeria, or (c) Forms part of the continental shelfs, or (d) forms part of the Exclusive Economic Zone of Nigeria. (3) In this section references to 'territorial waters' are references to the expression as defined in the Territorial Waters Act.

Policies regulating contracts, certification of exploitation and exploration, training and manpower development of resident staff and communal participants and dwellers, oil and gas research grants to indigent indigenes, financial regulatory guidelines, and environmental impact assessment regulations are all crafted without recourse to the oil and gas community occupants' inputs. Therefore, having x-rayed the theoretical challenges of the oil and gas industry in Nigeria, we want to empirically review its developmental relevance to the aggregate economy.

Nigerian Oil and Gas Evolutionary Road Map from Precolonial to Present Day

Nigerian first large scale petroleum mining was in carried out on 2nd June 1956 in OLOIBIRI village in Ogbia local government areas of present-day BAYELSA state south-south geopolitical zone of Nigeria. Until 1977 (i.e. after 21years), when NNPC was established to manage the Federal Government interest in the Oil and Gas Industry, the International Oil Companies led by Shell were the sole manager of the sector by way of pricing, financing exploration, and other ancillary

services related to therewith. The regulatory, collection of fees from explorations, licencing, production leases, taxes and royalties on crude were the duties of the Government. The Petroleum Acts of 1969 avail citizens and companies incorporated in Nigerian the participatory rights of exploratory, prospecting and mining licenses as well as the discretionary options of government ownership at any concessionary agreements Yinka, (2001). Therefore, the confluence of projects affordability and accessibility to funding, environmental friendliness and sustainability of returns on investment remain a fundamental issue. The microclimate and macroclimate financing interactions in the long run is a major determent of investment success measured by the financial wellness of the stakeholders (Federal Government and her citizens). This is the motivation for the Nigerian Local Content Acts of 2010, for which many applauded as laudable and noble though implementation and benefit still latent. It is against this backdrop that Afeti (2010); Gbegi and Adebisi (2013) assert that the appropriateness of local content acts ought to manifest in skills and knowledge drive as the engine for economic rebirth and national transformation using the vehicle of Technical Education and Vocational Training. The acts sees local content as the deployment of Nigerian resources for value additivity to the petroleum industry that will bring about growth of local competency and proficiency without compromising quality, health, safety and environmental-related standards. Below are some of the legislative road map for the Nigerian Oil and gas industry. To the best of our knowledge, the right to regulate the oil and gas landscape in Nigeria started with the Mineral Oils (Safety) Regulations (L.N. 45 of 1963) and followed by the Petroleum Regulations (L.N. 71 of 1967), Petroleum Acts (1969), Petroleum (Drilling and Production) Regulations (L.N. 69 of 1969), Petroleum Refining Regulations (LN. 45 of 1974), Crude Oil (Transportation and Shipment) Regulations (S. l. 44 of 1984), Deep Water Block Allocations to Companies (Back-In-Rights) Regulations (S. l. 7of 2003), Oil prospecting licences (conversion to oil mining leases, etc.) Regulations (S.1. 5 of 2004) Nigerian oil and gas industry content development Act, 2010, Petroleum Industry Bill of 2011. All of these legislative pronouncement maintain unhealthy silence about oil and gas financing. They rather entrust the ownership rights of petroleum on the central Government to us did not go down well with all. This is revealed by various legislative pronouncement that:

'The property and control of all petroleum in, under or upon any lands within Nigeria, its territorial waters, the Continental Shelf and Exclusive Economic Zone is vested in the Federal Government of Nigeria'

Oil and Gas Operations and Financing Options in the 21st Century

A substantial number of recognized stockholders in infrastructure debt includes pension funds (public and private) and insurance companies. The long-term nature of oil and gas ventures matches the long-term liabilities nature of insurance companies and pension funds so as to avoid the financing mismatch. Basel III regulations constrains banks' ability to lend long-term and borrow short because of variation in gestation periods hence, banks' lending appetite blunt as is its risk suspicion heightened. This underscores the relevance of joint venture financing of oil and gas reserves which make available the prospects for firms with access to investable and government funds. Going by the scales of investments constraint in energy infrastructure, the organized private sector (OPS) has a critical part in these large-scale energy projects financing. Public policymakers have to develop a deliberate framework in support of private sector participation through the design of financial engineering vehicles that will change the current market dynamics in a volatile and competitive business environment. A good example of these financial ingenuities are assets securitization and mortgage-backed funding. Explicitly tailored funds directed at varying the nature of the industry lessens the high blunt capital costs linked with

technologies desirable for strong oil and gas systems. The following are some oil and gas industry financing options regardless of its high risk, nature and governance interference. Sustaining states ownership and rights of hydrocarbons wealth obstructs organized private investors from taking advantage inherent on the oil and gas unit of the macroeconomic sector. Other inhibiting factor is the overbearing influence of the international oil companies resulting from information distortion powered by lack of transparency between the host governments the various firms. The various network of activities in the petroleum sector like exploration, profit-sharing contracts (PtSC), production sharing contracts (PnSC) as well as licenses of various categories made it difficult for local input to be relevant. Besides, activities such as refining and transportation contracts, storage, and natural gas processing and petrochemicals sectors-driven activities, sovereign wealth fund creation, establishment of different Petroleum Stabilization and Development Funds lends credence for its high technical needs. These metrics and network of projects have challenging financial and non-financial implications on the accurate evaluations of risk profile without which projects desirability is traded for nothing. Consequently upon these, investment bankers and other financiers' willingness to partner with positive net present valued assets and sound return on investment projects will not be motivated. This is predicated of the premise that projects bankrolled on the ground of inaccurate risk profile has increased risk of failure. This discourages investors.

Mezzanine: A hybrid of debt and equity financing naturally used for financing expansion of already existing going concern business entities. It is principally a debt capital. Sometimes we call it sweetener as it offers the lender the rights of convertibility to equity interest when loans are not paid as stipulated or heading towards breaches. It is by and large subordinated to debt granted by banks and venture capital firms for financing growth opportunities like acquisition, innovative and fresh product line, plant expansion and management buyouts.

Reserve Based Lending: Here the loans are collateralized by the borrower's oil and gas reserves value for which repayment stems from earnings resulting therefrom (Michael & Wilson, 2014; Loney & Wong, 2015).

Non-Recourse Project Finance: Here the lenders only entitlement is on the repayment from the funded project profits and not on borrowers' assets.

Project Bond: These are financial instrument slightly different from the financial product itself. It is a tripartite contract where applicants' obligation is to show their ability to control a businesses based on a solid track record of enviable performances. They should also have a professional, financial and strategic management team with established technical capacity to deliver contractual obligations.

Gap funding or bridge financing: This is where bidders for the funding are allowed to stand up to partially financed bids as bid closes while the respective government make up for the shortfall that are not accessible in the market.

Partial funding: This has some of the followings as its variants Public-private partnership (PPP), Built owned operate and transfer (BOOT), Built operate and transfer (BOT). They are exercisable within sets of refinancing window where government fund the venture in conjunction with the consortium at a predetermined time as soon as credit markets conditions improves. As the quest for financing new technical discoveries underpinning oil and gas development grows partly due to deeper waters exploration and extraction, the associated deep water-related disaster destabilizes the risk-return equilibrium.

Oil and gas exploration and appraisal implores these financing options; Private equity, initial public offers and supplementary issues. Due to high level of uncertainty surrounding the development and production stages, reserves based lending, public bonds, Project-specific finance as well as private placement are recommended. Also on the list of financing option for development and production are multilateral development banks financing in the form of syndicated loans and mezzanine financing for all proved reserves- Reserves of crude oil and natural gas appraised by geological, engineering and production unit that reveal with practical economic certainty in no distant future in various reservoirs or basins with the aid of economic and financial analytical tools. On the other hand, Oil and gas portfolio expansion are better financed using operational cash flow, traditional deposit money bank loans, public bonds, infrastructure and project-specific funds as well as divestment proceeds. These options are driven by sponsors' concern and investment culture hinge on predominant political ideology, current regulatory framework, legal, sociocultural and environmental challenges underpinning project riskiness. This aforementioned drives are no doubt the result of far-reaching due diligence reviews and projects environmental scanning.

Methodology, Specification of relevant Models and Analysis

The model below is considered relevant to econometrically reveal the various financing options relationship with the national economic growth and development as a sufficient condition beyond the theoretical postulations. Time series data from Central Bank of Nigeria (CBN) Statistical Bulletin and annual reports of various issues were used for this study for the period of 1980-2014. Other globally relevant data were sourced from: data.worldbank.org/indicator/BX.KLT.

DINV.CD.WD/countries? Display=default. Functionally, our model is decomposed as:

$GDP = NORev + ORev + FDIoil + Credit_{oil} + Excr_t + INF_t$

Where the regression equation in its econometrical form is expectedly presented thus:

$GDP_{it} = \beta 0 + \beta 1\ NORev_t + \beta 2\ ORev_t + \beta 3\ FDIoil_t + \beta 4\ Credit\ oil_t + \beta 5\ Excr_t + \beta 6\ Inf_t + \varepsilon t$

$NORev_t$= revenues from non-oil sector in time t;

$ORev_t$= revenues from oil sector in time t;

FDI_{oilt}= Foreign direct investment to oil related sectors in time t;

$Credit_{oilt}$= All Credit to oil related investments in time t;

$Excr_t$ = Exchange Rate for the period of interest in time t; and

Inf_t =Inflation rate for the same period.

$\beta 1, \beta 2, \beta 3, \beta 4, \beta 6 > 0; \beta 5 < 0$

Discussion and Presentation of Result

Here, it discusses and presents the empirical findings from the study. First, the descriptive statistics of the key variables in this study, real GDP, Oil revenue, Non-oil Revenue, credits (to oil sector), FDI, exchange rate and inflation are presented, then the explanatory variables are also presented and discussed. Furthermore, the results from the models estimated are presented. The summary statistics of all the variables used in this exercise are presented below in Table 1. Specifically, the mean, median, minimum and maximum values, standard deviation, the skewness

and kurtosis, Jarque-Bera values and their respective probability values are also stated in Table 1, while Table 2 displays the correlation matrix. The mean of each of the variables is indicates the average of the respective variables as it is used in the study. The standard deviation further reveals how dispersed the variable is from the average; thus it shows the explosiveness of the variables. Furthermore, the skewness and kurtosis values indicate asymmetry and peakedness of the distribution while the normality test was carried out using the Jarque-Bera statistics.

The results in Table 1 reveal that both mean and median values for all the variables are in line with the random time series trend. The normality test conducted using the Jarque-Bera statistics reveals that all the variables are normally distributed. The Jarque-Bera statistics and the respective probability values are stated in Table 1 below.

Table 1: Descriptive Statistics

	RGDP	OILREV	NONOREV	OILLOANS	FDI	EXCHR	INF
Mean	26068.49	2149.038	661.0874	240406.0	311.2344	67.95706	19.91471
Median	16364.24	412.7950	152.6500	17830.25	38.98000	21.97000	12.38000
Maximum	68397.10	8878.970	3275.120	1295299.	1368.070	158.5500	72.73000
Minimum	9441.630	7.250000	2.980000	1.23E-05	0.150000	0.610000	3.230000
Std. Dev.	18605.02	2779.529	940.5352	431415.0	431.2280	63.76777	17.68373
Skewness	0.999502	1.054474	1.491836	1.611318	1.149405	0.218264	1.522034
Kurtosis	2.555795	2.695156	4.064673	3.858118	2.874673	1.242870	4.278969
Jarque-Bera	5.940560	6.432506	14.21742	15.75581	7.508671	4.643919	15.44465
Probability	0.051289	0.040105	0.000818	0.000379	0.023416	0.098081	0.000443
Sum	886328.8	73067.28	22476.97	8173803.	10581.97	2310.540	677.1000
Sum Sq. Dev.	1.14E+10	2.55E+08	29192015	6.14E+12	6136601.	134188.8	10319.58
Observations	34	34	34	34	34	34	34

Source: Author's Computation 2018

Correlation Matrix

The correlation matrix is presented in Table 2. The result reveals that the relationship among real GDP, policy variables, consumer price index proxy by inflation rate is negative while that of the exchange rate is positive. This tends to suggest that improvements in exchange rate policies correlate positively well with real GDP. In addition, real GDP is also positively related to oil revenue, non-oil revenue, credits to oil sector and foreign direct investment. Similarly, oil revenue is positively related to foreign direct investment and exchange rate, suggesting that macroeconomic stability, realistic exchange rate reform can stimulate the level of domestic investment. A key point to note is that exchange rate positively correlates with all the variables used in this study, while inflation negatively correlate to all the variables suggesting that an improvement in the level of policy variables Nigeria would not only promote economic growth but also guarantee some level of macroeconomic balance.

Table 2: Correlation Statistics of All Variables Employed

	RGDP	OILREV	NONOREV	OILLOANS	FDI	EXCHR	INF
Real GDP	1.000000	0.954607	0.967702	0.813150	0.931834	0.893933	-0.369077
Oil Revenue	0.954607	1.000000	0.907034	0.796383	0.925553	0.867630	-0.363153
Non-Oil Revenue	0.967702	0.907034	1.000000	0.769538	0.866766	0.821187	-0.337220
Credit oil	0.813150	0.796383	0.769538	1.000000	0.910559	0.686034	-0.274702
FDIoil	0.931834	0.925553	0.866766	0.910559	1.000000	0.836034	-0.340582
Exchange Rate	0.893933	0.867630	0.821187	0.686034	0.836034	1.000000	-0.398886
Inflation Rate	-0.369077	-0.363153	-0.337220	-0.274702	-0.340582	-0.398886	1.000000

Source: Authors' Computation 2018 from E-Views 8

Stationarity and Co-integration Test

To avoid spurious and preposterous regression result on the time series data, the Augmented Dickey Fuller (ADF) Test for unit root was carried out to ascertain the stationary Status of the data series. This is shown Table 3. The results reveal that all the variables (except Credit oil and Gas) under consideration have first-order integration; hence the estimations exhibit a common unit root process at second difference. This, in turn, suggests the appropriateness of using least squares estimation procedure since the theoretical formation is premised on the normality assumption.

From the Stationarity test results, all the series were found to be stationary, although not at levels, but at first difference I(1) except Credit oil sector. Thus, the variable entering our model is in line with the prescription of Blundell and Bond (1998) that elements of the equation must be in their first difference. All the variables in the model were integrated variables but attain stationarity after first and second differences. RGDP, OILREV, NONOREV, FDI, EXCHR and INF attained stationarity after first differences, while OILLOANS became stationary after second difference.

Table 3(i): Test for Stationarity Using Augmented Dickey-Fuller (ADF) Unit Root at Level

	ADFt-Statistic	ADF lag length	ADF Critical values			Remarks
			1% level	5% level	10% level	
RGDP	0.058364	0	-4.262735	-3.552973	-3.209642	Non Stationary
OILREV	-2.618432	0	-4.262735	-3.552973	-3.209642	Non Stationary
NONOREV	0.614546	0	-4.262735	-3.552973	-3.209642	Non Stationary
Credit oil	-1.647613	0	-4.262735	-3.552973	-3.209642	Non Stationary
FDI	- 2.091127	0	-4.262735	-3.552973	-3.209642	Non Stationary
EXCHR	-2.145017	0	-4.262735	-3.552973	-3.209642	Non Stationary
INF	-3.048692	0	-4.262735	-3.552973	-3.209642	Non Stationary

Table 3(ii): Unit Root Test for Stationarity at First Difference

	ADFt-Statistic	ADF lag length	ADF Critical values			Remarks
			1% level	5% level	10% level	
RGDP	-3.787810	0	-4.273277	-3.557759	-3.212361	Stationary
OILREV	-6.824205	0	-4.273277	-3.557759	-3.212361	Stationary
NONOREV	-7.763616	0	-4.273277	-3.557759	-3.212361	Stationary
Credit oil	-1.667002	0	-4.273277	-3.557759	-3.212361	Non Stationary
FDI	-7.357768	0	-4.273277	-3.557759	-3.212361	Stationary
EXCHR	-5.316043	0	-4.273277	-3.557759	-3.212361	Stationary
INF	-5.746959	0	-4.273277	-3.557759	-3.212361	Stationary

Source: Authors' Computation 2018 from E-Views 8

Table 3(iii): Unit Root Test for Stationarity at Second Difference

	ADF Test Statistic	ADF lag length	ADF Critical values			Remarks
			1% level	5% level	10% level	
RGDP	-6.778460	0	-4.284580	-3.562882	-3.215267	Stationary
OILREV	-8.860084	0	-4.284580	-3.562882	-3.215267	Stationary
NONOREV	-12.56911	0	-4.284580	-3.562882	-3.215267	Stationary
Credit oil	-8.330805	0	-4.284580	-3.562882	-3.215267	Stationary
FDI	-12.98216	0	-4.284580	-3.562882	-3.215267	Stationary
EXCHR	-9.250332	0	-4.284580	-3.562882	-3.215267	Stationary
INF	-7.720134	0	-4.284580	-3.562882	-3.215267	Stationary

Source: Authors' Computation 2018 from E-Views 8

The null hypothesis of non-stationarity of the variables in the model is rejected after differencing at the 5% level of significance. The study was further subjected to the Johansen Fischer cointegration test. The co-integration result for the first objective reveals evidence of a co-integrating relationship as shown by the significance of the Fisher statistics from Trace test and Max-Eigen test to ascertain its reliability. The result shows that all the variables used in the study are all significant at the conventional test levels as shown in Table (D). Basically, the test was conducted to of proceeding further in the analysis.

Table 4: Johansen-Fisher Cointegration Test Results

Variables	Hypothesized No. of CE(s)	Fisher Statistics from Trace Test		Fisher Statistics from Max-Eigen Test	
		Statistics	P-Values	Statistics	P-Values
Series: RGDP OILREV NONOREV Credit oil FDI EXCHR INF	None	640.8601	0.0000	205.7181	0.0000
	At most 1	435.1420	0.0000	160.4036	0.0000
	At most 2	274.7384	0.0000	132.0108	0.0000
	At most 3	142.7277	0.0000	91.80191	0.0000
	At most 4	50.92578	0.0000	35.19869	0.0000
	At most 5	15.72709	0.0000	9.583183	0.0000
	At most 6	6.143905	0.0000	6.143905	0.0000
	Trace test indicates 7 cointegrating equation(s) at the 5% level Trace test indicates 5 cointegrating equation(s) at the 1% level		Max-eigenvalue test indicates 5 cointegrating equation(s) at both 5% and 1% levels *(**) denotes rejection of the hypothesis at the 5%(1%) level		
	*(**) denotes rejection of the hypothesis at the 5%(1%) level				

Source: Authors' Computation 2018 from E-Views 8

Preliminary Analysis

From the problem stated above, the contribution of various financing options available to Nigerian oil and gas sector of the economy is reviewed with respect to growth using the Ordinary Least Squares (OLS) technique as Vector Error Correction (VECM) model appear the central model for the study.

Table 5: OLS Estimation Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	11183.98	1010.557	11.06714	0.0000
OILREV	0.995340	0.474238	2.099000	0.0453
NONOREV	10.19299	1.170605	8.707452	0.0000
Credit oil	-0.001551	0.002731	-0.568062	0.5747
FDI	10.59597	4.398133	2.409198	0.0231
EXCHR	46.55647	15.21467	3.059972	0.0050
INF	-4.101848	27.71355	-0.148009	0.8834
R-squared	0.984278	Mean dependent var		26068.49
Adjusted R-squared	0.980784	S.D. dependent var		18605.02
S.E. of regression	2579.070	Akaike info criterion		18.72949
Sum squared resid	1.80E+08	Schwarz criterion		19.04374
Log likelihood	-311.4013	Hannan-Quinn criter.		18.83665
F-statistic	281.7179	Durbin-Watson stat		1.949127
Prob(F-statistic)	0.000000			

Source: Authors' Computation 2018 from E-Views 8

Impact Assessment of the independent variables on the Dependent variable

The estimation result shows that there exists a direct relationship between real Gross Domestic Products and oil Revenue in Nigeria. Specifically, ₦1 billion increase in oil Revenue will lead to a ₦0.995340 billion increase in the real GDP level in Nigeria and vice versa. Interestingly, the t–statistic shows that oil revenue is statistically significant when considering the key factors influencing Economic growth in Nigeria. The coefficient of Non-oil revenue is positive. This indicates that ₦1 billion increase in oil revenue will lead to a ₦10.19299 billion increase in the real GDP level in Nigeria and vice versa. In addition, the t–statistic shows that non-oil revenue is a statistically significant factor inducing Economic growth in Nigeria. From the results, the coefficient of the oil sector credits is negative and statistically insignificant. This is in line with our apriori expectation. This implies that ₦1 billion increase in oil sector credits will lead to ₦ 0.001551 billion decrease in the real GDP level in Nigeria. The coefficient of FDI is positive indicating that ₦1 billion increase in FDI stock will increase the real GDP level in Nigeria by ₦10.59597 billion. The t–statistic further revealed that FDI is a statistically significant factor that stimulates Economic growth in Nigeria. The coefficient of exchange rate indicates that a ₦1 appreciation in exchange rate will cause the level of real GDP to increase by ₦46.55647. This is also statistically significant.

The coefficient of inflation is negative and this implies that there is a negative correlation between inflationary pressure and the real GDP growth rate in Nigeria. In other words, a one percent rise in the rate of inflation in Nigeria will depress the growth rate of the Nigerian economy by 4.101848 percent. This is because inflation acts as a disincentive to investment which, in turn, causes the economy to contract leading to a recession or even a depression if not properly handled. The coefficient of the constant intercept showed that, even if all the explanatory variables are held constant, the level of Real GDP will remain ₦11183.98 billion The coefficient of determination (R^2) and its adjusted counterpart indicate that, about 98 percent of the systematic variation in the explained variable (real GDP) is accounted for by the joint influence of the explanatory variables. The F–statistic indicates a rejection of the null hypothesis. We therefore conclude that the explanatory variables are simultaneously significant in addressing causality issues in regards to Nigeria.

Table 6: Short-run parsimonious Vector Error Correction Result (VECM (1,1, 1, 1, 1, 1,1, 0, 0,0)

Variables	Coefficient	Std errors	t-stat	p-value	Remark
D(RGDP(-1)	0.0957365	0.218394	0.4384	0.6663	N.significant
D(oilrev(-1)	0.841436	0.47966	1.75425	0.0276	Significant
D(nonlrev-1)	-1.18701	1.06491	-1.115	0.2797	N.significant
D(oilloan-1)	0.00710828	0.0020978	3.388	0.0033	Significant
D(FDI-1)	-4.01525	1.98996	-2.018	0.0588	Significant
D(Exchr-1)	-15.1198	13.5255	-1.118	0.2783	N.significant
INF	-1.92823	7.11177	-0.2711	0.7894	N.significant
ECM	-0.234824	0.0703887	-3.336	0.0037	Significant
Constant	2119.64	876.899	2.417	0.0265	Significant
F-stat	9.197602	R-Squared	0.934273		
DW	2.213310	Adj.R^2	0.832695		

Excluding the constant, p-value highest for variable 8 (INF): Authors' Computation 2018 using Gretl

Table 6 reveal that FDI negatively and significantly impact on Real GDP with a coefficient of -4.01525 indicating that ₦1 billion increase in one period lag of FDI stock results to a ₦4.01525 billion fall in real GDP. However, the negative but highly significant result from the model may provide evidence of resource curse as dependence on it may hinder incentives to invest (Kurronen, 2012). For import-dependent and low-income country like Nigeria, when income effect is controlled for, the more there are natural resources the more is FDI attracted into such countries. The results also showed that oil Revenue impacts positively and significantly on Real GDP with a coefficient of 0.841436. This implies that a ₦1 billion increase in one period lag of Revenue from oil results to a ₦ 0.841436 billion rise in real GDP. This result is consistent with several studies that oil revenue is vital for the economic growth of developing countries where savings-investment and foreign exchange gaps exist as well as capital scarcity glitches. The results further revealed that Non-oil Revenue impacts negatively though insignificantly on Real GDP with a coefficient of -1.18701. This implies that a ₦1 billion increase in one period lag of Revenue from Nigeria's non-oil sectors result to a ₦1.18701 billion fall in her real GDP level.

Perhaps these increases goes into privates bank accounts for onward transmission to foreign nations which further increase their productive efficiency and lower their cost of capital. This is obvious to the blind and audible to the deaf. The results further indicated that credits to oil and gas sector impact positively and significantly on Real GDP with a coefficient of 0.00710828. This means that a ₦1 billion increase in a one-period lag of the credits to the oil and gas sectors result to in ₦ 0.00710828 billion increase in real GDP level. This in yet one of the paradoxes in the Nigerian economic portfolios. Where funds are channeled to the sectors that drives aggregate output with efficient absorptive capacity in line with the canons of public expenditure, a proportionate increment ought to be follow such investment decisions.

Also from the results above, the coefficient of exchange rate indicates that a ₦1 appreciation in a one period lag of exchange rate will cause the level of real GDP to decrease by ₦15.1198 although statistically insignificant in predicting changes in real GDP. The results further revealed that inflation impacts negatively though also insignificant on Real GDP with a coefficient of -1.92823. This implies that a one percent increase in the rate of inflation in Nigeria results in a 1.92823 percent drop in her real GDP. The short-run dynamic adjustment process required to establish a stable long-run equilibrium also revealed that Time factor impacts positively and significantly on Real GDP with a coefficient of 63.6123. This implies Ceteris Paribus, that a one year increase in a period of time results in a ₦63.6123 billion rise in real GDP. The coefficient of the constant intercept showed that, even if all the explanatory variables are fixed, the level of Real GDP will remain ₦2119.64 billion.

The negative coefficient of the ECM (-1) value confirmed the assertion that the variables in the model cointegrates. The statistically significant coefficient of the ECM (-0.234824) implies disequilibrium in the long run and the speed of adjustment of about 23% of the previous year's shocks are corrected in the current year short run. The adjusted coefficient of determination (Adj R-squared) of 83% of the systematic variation in the explained variable (real GDP) is accounted for by the joint impact of the independent variables as it accounts for elasticity as well as degree of freedom adjustments.

Sensitivity Analysis

Here, we try to situate our model behaviour under varying circumstances by introducing a control variable-Consumer Price Index (CPI) which represents inflation in the economy to observe the effect of macroeconomic policy. The results revealed that the error correction factor is -0.234824

with a p-value of 0.0037. This suggests that the error correction model is statistically significant and about 23% of errors is corrected per period and Oil Revenue also exerted a positive significant impact on economic growth in short and long-run with a factor of 0.841436 and 0.995340 respectively. This shows that our model was sensitive to the various prevailing macroeconomic policy, 83% of the regular variations in the dependent variable is predicted by the causal variables coupled with strong joint significance manifesting in the F-statistic. The DW statistic of 2.213310 is within the acceptance range (1.8-2.3), indicative of the absence of serial correlation.

Alternatively, the result is subjected to the Breusch-Godfrey diagnostic check for serial correlation with result indicating its absence as presented in Table 7 below.

Table 7

F-statistic	0.955771	p-value	0.337
Chi-square	1.20554	p-value	0.272

Source: Authors' Computation 2018 using Gretl

The Results from Table 8 below clearly indicate that the null hypothesis cannot be rejected. Hence, the model is free from autocorrelation.

Table 8: Dynamic Least Squares (DOLS) Methodological Approach

Variable	Coefficient	Std. Error	t-Statistic	Prob.
OILREV	0.995340	0.490199	2.030484	0.0523
NONOREV	10.19299	1.032306	9.874000	0.0000
OILLOANS	-0.001551	0.002408	-0.644166	0.5249
FDI	10.59597	3.878523	2.731961	0.0110
EXCHR	46.55647	13.41716	3.469920	0.0018
INF	-4.101848	24.43937	-0.167838	0.8680
C	11183.98	891.1667	12.54981	0.0000

Source: Authors' Computation 2018 from E-Views 8

The Results above revealed that in the long-run, FDI has a positive and statistically significant impact on growth as shown in Table 8 above. Explicitly, ₦1billion increase in the value of FDI stock produces approximately ₦10.59597 billion increase in economic growth. The results also showed that oil Revenue impacts positively and significantly on Real GDP with a coefficient of 0.995340. This implies that a ₦1 billion increase in Revenue from oil results to a ₦0.995340 billion rise in real GDP. The results further revealed that Non-oil Revenue impact positively and significantly on Real GDP with a coefficient of 10.19299. This implies that ₦1 billion increase in revenue from Nigeria's non-oil sectors result to ₦10.19299 billion rise in her real GDP level. The results further indicated that credits to oil and gas sector impact negatively though insignificantly on Real GDP with a coefficient of -0.001551. This means that ₦1 billion increase in the credits to the Nigerian oil and gas industry result in to ₦ 0.001551 billion fall in her real GDP level. Exchange rate movement indicated that a ₦1 appreciation in exchange rate will cause the level of real GDP to increase by ₦46.55647. However, it is statistically significant in the predicting changes in real GDP of most sovereign nations. The results further revealed that inflation impacts negatively although insignificantly on Real GDP with a coefficient of -4.101848. This implies that a one percent increase in the rate of inflation in Nigeria results in a 4.10 percent fall in real GDP. The

coefficient of the constant intercept further indicated that, even if all the explanatory variables remain unchanged, the level of Real GDP will remain ₦11183.98 billion in the long run.

Table 9: Pairwise Granger Causality Tests for selected variables

No.of Lag	Null Hypothesis	Obs	F-Statistic	Prob.	Causation
2-Period	OILREV does not Granger Cause RGDP	32	3.22710	0.0554	OILREV ⟶ FDI
	RGDP does not Granger Cause OILREV		17.7958	1. 000	FDI ⟶ RGDP
2-Period	NONOREV does not Granger Cause RGDP	32	2.40888	0.1090	NONOREV ⟶ RGDP
	RGDP does not Granger Cause NONOREV		5.96636	0.0071	RGDP ⟶ NONREV
2-Period	OILLOANS does not Granger Cause RGDP	32	3.53769	0.0432	OILLOANS ⟶ RGDP
	RGDP does not Granger Cause OILLOANS		1.04772	0.3646	
2-Period	FDI does not Granger Cause RGDP	32	0.83737	0.4438	FDI ⟶ RGDP
	RGDP does not Granger Cause FDI		4.88902	0.0154	RGDP ⟶ FDI
2-Period	EXCHR does not Granger Cause RGDP	32	6.54152	0.0048	RGDP ⟶ FDI
	RGDP does not Granger Cause EXCHR		0.11825	0.8889	
2-Period	INF does not Granger Cause RGDP	32	2.71077	0.000	RGDP ⟶ FDI
	RGDP does not Granger Cause INF		1.36756	0.007	RGDP ⟶ INF

Note: Null Hypothesis: H_{01}: A does not Granger Cause B, and H_{02}: B does not Granger Cause A. Where the notation; A ⟶ B means, variable A Granger Causes B. When A Granger causes B and B granger Causes A, then A and B are said to be complementary.

Source: Authors' Computation 2018

Conclusion, Policy Implication and Recommendations

To evade price unpredictability, market participants uses varied categories of financing contracts and products. This leads to the financial ingenuity resulting from financial engineering such as hedging against exposure, securitizations of corporate assets so as to make available prospects for investors to provide flexibility financing solutions. Liberalising oil and gas subsector of the economy will make it more resilient to foreign markets shocks thereby reducing the dominant role of states. The emergence of the 21st century risks of life-threatening weather and regulators insincerity at frameworks articulation stages is a threat to global oil and gas industry.

To build flexibility energy sector, interested party must understand the impact of extreme weather condition on energy infrastructure. Therefore oil and gas companies and project originators, financial institutions, insurance companies, investors of different shapes and sizes, governments, and regulatory bodies need to join forces together. This is because healthier harmonization will drive innovative ideas, high-tech standards performance, and financial engineering and risk transmission mechanisms. Oil and gas industry financiers and institutional

investors must interact nicely with industry stakeholders (the states, interdependent and interrelating environment) with a view to getting the feelings of current regulations, public interest pronouncements as well as those to whom the sectoral externalities inconvenienced. Undoubtedly, changes driven by globalization and financial market ingenuity resulting from assets securitization has steer oil and gas business environment capacity to secure funds desired capital intensive infrastructure projects. Nonetheless, others sees it as constraint while it is freedom. Absence of transparency in governance coupled with integrity issues not liquidity or paucity of fund made most oil and gas nations to be the breeding place for violence, unending conflicts and insurgency. This to us is sequel to the scenario where some national fiscal appropriations and budgeting become the feeding trough of few politically exposed citizens.

References

Abeysinghe, T. (2001). Estimation of Direct and Indirect Impacts of Oil Price on Growth. *Economic Letters*, 73(2), 147–153.

Afeti, G. (2010). *Technical and vocational education and training for industrialization*. (Working Paper No. 40/95). Retrieved from www.arrforum.org/occasional-papers/40/95

Ayadi, O. F. (2005). Oil Price Fluctuations and the Nigerian Economy. *OPEC Review* 29(3), 199–217.

Ayonmike, C. S., & Okeke, B. C. (2015). The Nigerian Local Content Act and its implication on Technical and Vocational Education and Training (TVET) and the nation's Economy. *International Journal of Education Learning and Development*, 3(1), 26-35.

Balouga, J. (2012). Nigerian local content: challenges and prospects. *International Association for Energy Economics, 23-26.*

Dohner, R. S. (1981). Energy Prices, Economic Activity and Inflation: Survey of Issues and Results, In Knut Anton Mork (Eds.), *Energy Prices, Inflation and Economic Activity* (pp.7-41). Cambridge, Mass: Ballinger

Gbegi, D.O., & Adebisi, J.F. (2013). Managing local content policies in the extractive industries. *Research Journal of Finance and Accounting*, 4(7), 90-98.

Granger, C. W. (1980). Long memory relationships and the aggregation of dynamic models. *Journal of Econometrics*, 14(2), 227-238.

Granger, C.W. (1981). Some properties of time series data and their use in econometric model specification. *Journal of Econometrics*, 16(1), 121-130.

Kurronen, S. (2012). *Financial sector in resource-dependent economies* (*BOFIT Discussion paper No.6/2012).* Retrieved from https://pdfs.semanticscholar.org/008b/6dc656f679423c731af4e1243370Abe1814e.

Loungani, P. (1986). Oil Price Shocks and the Dispersion Hypothesis. *Review of Economics and Statistics*, 68(3), 536-539.

Loney, J., & Wong, A. (2015). *A Crude Wakeup Call: What the Price of Oil Means for Reserve-Based Lending*. Toronto: McMillan LLP Business Law Bulletin

Michael, P. M., & Wilson, R.A. (2014). A future for Reserve-Based Lending in Emerging markets? Limitations of the Traditional Model. *Texas Journal of oil, gas, and energy law*, 10(1), 150-203.

Tordo, S. (2007). *Fiscal Systems for Hydrocarbons: Design Issues* (World Bank Working Papers No. 123), Washington DC: World Bank.

Yinka, O. (2001). *Oil and Gas Laws in Nigeria*. Lagos: Malthouse press Limited.

Author's Profile

Sharlywest Uwabor Eboigbe is a Lecturer in the Department of Banking and Finance, University of Benin, Benin, Nigeria. He teaches Managerial Accounting and Finance, International trade and finance, Quantitative analysis, Investment, Capital & Commodity markets, Computer Application, and monetary theory and policy. He has serve in various committees within the university including Departmental Representative to the University Admissions Board (2010-2012); Management Sciences Faculty Representative to the University Central Certificate Screening Committee[b] [/b](2013-2016), Departmental Examination Officer (2017/2018) and currently the Management Sciences Faculty Representative to the Faculty of Social Sciences Board. As a multi-skilled professional for the 21st century multi-tasked global environment, he is a [b]Senior Member[/b], Chartered Institute of Loans and Risk Management of Nigeria (CLRM), [b]Associate Member[/b] of the Chartered Institute Taxation of Nigeria (CITN) and [b]Associate Member[/b] of the Institute of Chartered Accountants of Nigeria (ICAN). He served as [b]General Secretary[/b], Institute of Chartered Accountants of Nigeria-ICAN Benin & District Society (2012-2014); [b] Secretary[/b], Technical & Training-ICAN-Eastern Zonal Districts (comprising South-South/South-East geopolitical zone of Nigeria (2012-2013), [b]Chairman[/b], Examinations Committee-ICAN-Benin & District Society (2012-2014) and [b]Member[/b]-Technical & Training-ICAN-Southern Zonal Districts 2017-Till date. An [b]ASSESSOR[/b] to ICAN Examinations; [b]Chairman[/b]-Budget Symposium and Economic Discourse Work Group (BSEDWG) and [b]Member[/b]- Technical, Research and Public Policy Committee (TRPPC) at the Institutes headquarters in Lagos. He has many researched journal articles (local and international) where his areas of interest are International finance, Politico-Economics and Financial dynamics, Microfinancing and other emerging Investment Financing options. He is the current Departmental record breaker and holder as the first to obtain Ph.D Finance in 33 months.

Victor Usunobun Imagbe holds a NCE in Business Studies from College of Education, Warri, (Distinction); B.Ed in Business Education from University of Benin; PGD in Accounting from College of Accountancy, Jos; BSc in Accounting from Achievers University, Owo (First Class); M.Sc in Accounting from Igbinedion University, Okada; Ph.D in Accounting from Igbinedion University, Okada. He is a fellow of the following bodies; Association of Chartered System Accountants (USA), Certified Forensic Investigation Professional, Institute of Corporate Administration of Nigeria. He also a member of other professional bodies. He's the Managing Director, UNIBEN Microfinance Bank, Benin, Nigeria.