Oil price shocks and Nigerian economic growth.

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Abstract

This study employs the general methods of moment (GMM) to examine the impact of oil price shocks on the Nigerian economy, using data from 1981 to 2012. After appropriate robustness checks, the study finds out that oil price shocks insignificantly retards economic growth while oil price itself significantly improves it. The significant positive effect of oil price on economic growth confirms the conventional wisdom that oil price increase is beneficial to oil-exporting country like Nigeria. Shocks however create uncertainty and undermine effective fiscal management of crude oil revenue; hence the negative effect of oil price shocks.

Keywords: Oil Price Shocks, Economic Growth, GMM

Introduction

Nigeria gained an extra US$390 billion in oil-related fiscal revenue over the period 1971 - 2005 (Budina and Wijnbergen, 2008). What has the nation got to show for this? Despite such windfall, Nigeria has an increasing proportion of impoverished population and experienced continued stagnation of the economy (Okonjo-Iweala and Osafo-Kwaako, 2007). The country, like many other oil-rich countries (ORCs) economically underperforms many resource poor countries (Karl, 2004). Her oil wealth has not been tapped to launch her onto economic heights; rather, she suffers from what Robinson, Torvik and Verdier (2006) describe as a resource curse – a paradox of poverty amidst plenty resources. Why?

One popularly identified bane of the country's economic situation is the Dutch Disease Syndrome (DDS) – the structural economic imbalance resulting from poor management of oil revenue, and perhaps its shocks. Windfalls that result from volatile oil price surges/shocks overwhelmingly flow through the economy; expand the oil sector and penalise the non-oil sector (Mieiro and Ramos, 2010). The resulting decline in the non-oil sector reinforces sharp decline in the economic growth rate when the price of crude oil falls.

Budina, Pang and Wijnbergen (2007), however, point out that DDS alone does not explain the slow growth of the Nigerian economy, especially her non-oil sector; rather, they identify volatility (or shocks) of oil price and its effect on other macroeconomic variables as the bane.

This study is prompted by fewness of studies on the impact of energy shocks on economic growth of oil-exporting countries like Nigeria, unlike studies on oil-importing countries (Olomola and Adejumo, 2006). Besides, the study attempts to query into the general conclusions of many recent studies that oil price fluctuations/market disequilibria have no impact on the Nigerian economy (see Ikla et al, 2012; Chuku, Effiong and Sam, 2010; Olomola and Adejumo, 2006, for a survey). Moreover, the study disagrees with these studies on explanation of the impact of oil price on economy via monetary variables like monetary supply and interest rates, having noted that their premise derive from Bernanke et al (1997), a study that focuses on an oil importing country, USA, rather than oil exporting countries like Nigeria. This study aims to extend the frontier of knowledge by estimating the impact of the oil price shocks on the Nigerian economic growth using aggregate demand framework that theoretically connect analytical variables, rather than just explaining output behaviour by oil price and host of arbitrarily suggested variables as done by earlier studies.

The analysis covers the period between 1981 and 2012, within which occur many oil market equilibrium-disturbing events. This paper is structured into four sections: section 1 introduces the discussion, section 2 presents the methodology, section 3 discusses the results and section 4 concludes.

Literature Review

This section reviews a number of issues in the literature that pertain to oil price volatility and its effects on the economy, with a special attention to the Nigerian case.

Oil and the Nigerian Economy

Prior to the discovery of crude oil in commercial quantity in 1956 (Adedipe, 2004; Odularu, 2007), the Nigerian economy, though largely

agrarian (Canagarajah and Thomas, 2001), was stable and steadily growing. The pleasant situation continued into the 1960s when agriculture played a dominant role in her economy in terms of contribution to GDP and foreign exchange earnings (Kwanashie, Ajilima and Garba, 1998).

The stability and gradual growth of the economy reversed in the era of oil-dominant economy. The reversed situation was synonymous with decline in the roles played by agriculture. The sector shrank in GDP contribution from 66% in 1958/59 (Kwanashie, Ajilima and Garba, 1998) to 16% in 2004 (United State Agency for International Development, 2006). Its contribution to the nation's export revenues and foreign exchange earnings plummeted from 86% in 1955-59 (Aigbokan, 2001) to 1.8% in 1996 (Balogun, 2001). These worrisome declines have been attributed to growing activities of oil and mining industy in the country (Kwanashie, Ajilima and Garba, 1998). Balogun (2001) attributes this problem to the poor management of public resources and inappropriate incentives, which in turn may not be unconnected with overwhelming inflow of oil revenues in the 1970s.

Crude oil has metaphorically been referred to as the 'black gold' (Bamisaye and Obiyan, 2006). The resource has redefined the global economy in general and the Nigerian economy in particular. The impact of crude oil on Nigerian economy has been double-edged. It has benefited the country in some ways, and has in many other ways turned out to be a curse (Ogwumike and Ogunleye, 2008).

Crude oil's contribution to GDP rose from 1.6% in 1960 to 11% in 2001 (Adenikinju, 2006). This contribution consists of proceed from oil export, local sale of crude oil for domestic refining and local sale of natural gas. However, the contribution has been limited due to substantial involvement of foreign investors in the oil sector, and consequent repatriation of the sector's profits and dividends abroad (Odularu, 2007). Crude oil also contributes over 90% of foreign exchange earnings in Nigeria (Adedipe, 2004; Adenikinju, 2006). Ogwumike and Ogunleye (2008) concur that the sector dominates other sectors in contributing to export revenues. For instance, it was responsible for over 98% of total export from the country in 2005.

Moreover, the sector contributes to provision of employment in the country (Odularu, 2007). The contribution has however not been relatively significant because it has limited linkages with the rest of the economy (Ibrahim, 2007). As a result, the sector employs only 1.3% of the total modern sector employment in Nigeria (Odularu, 2007).

The beneficial impacts of oil on Nigerian economy notwithstanding, the country has not significantly developed (Odularu, 2007). This is due to setbacks caused by oil-related activities. As noted earlier, the structure of the

economy has been mal-altered with the advent of oil. Other sectors have relatively declined in size and contribution to the economy while the oil sector has grown in size. For instance, the United States Agency for International Development (2006) notes the association between sharp rise in oil production in Nigeria in 2003 and decline in agriculture as a percentage of GDP from 29% in 2003 to 16% in 2004. In the same vein, contribution of the manufacturing sector as a percent of GDP has been in decline, in contrast to growth in the oil sector (Adedipe, 2004). Have Nigerian economic setbacks been solely and directly caused by oil activities? Reporting Perrings and Asuategi (2000), Ibrahim (2007) points out that there is weak empirical support for negative impact of natural resources on economic growth and development. Thus, it can be inferred that the poor performance the Nigerian economy may not be entirely due to oil activities, but to factors relating to policy management of oil resources in the country. Discussed below are some of these challenging factors:

Oil Price Shocks: Origin and Causes

Oil price shocks are not a new phenomenon: it has been a dominant feature in the oil market during the last two decades (Baumeister and Peerman, 2009). The market has been characterised with erratic movement of oil price since the 1970; moreover, there have been

Figure 1: Oil price shocks from 1960-2008
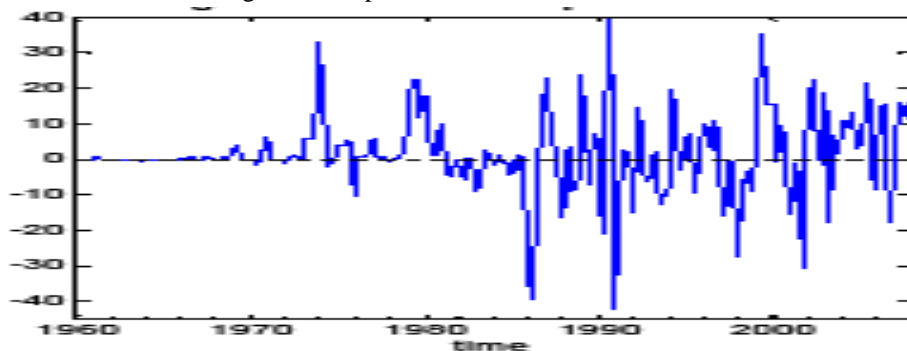
Source: Baumeister and Peerman, 2009

very large and sharp swings in the nominal price of oil since the collapse of oil price in 1986 (Sauter and Awerbuch, 2003). These shocks have been traced to many sources or origins. Understanding these origins will help in policy making against oil shocks.

Giraud (1995) highlights political and economic decisions in the oil industry as causes of oil price movements. While many writers focus on the economic factors, Mabro (1991a), as reported by Giraud (1995), states that

the day-to-day prices of oil may be determined by free market forces, but sharp shifts in price level are essentially motivated by political factors, an example of which is the politically motivated civil strives and unrests in the Middle East from where the bulk of crude oil supply emanate. Hamilton (2009) agrees with Mabro (1991) that supply disruptions are a significant factor of oil price volatility. He points out that politically-induced historical oil shock events such as the Yom Kippur War in 1973, Iranian Revolution in 1978, Iraq's invasion of Iran in 1980, and Iraq's invasion of Kuwait in 1990 have all spiked up oil prices despite increased production from non-OPEC countries to compensate for decline in OPEC's production. For example, the 1980 and 1990 events resulted in jump in oil price by 25% and 75% respectively (Hamilton, 2009). The hikes dissipate after the events, only to emerge with another event, thus creating shocks and disequilibria.

From an economic point of view, Baumeister and Peerman (2009) explain that oil price shocks results from low price elasticity of demand and supply. The result of this is that large price variation is required to clear the market, that is, to restore the market to equilibrium. Hamilton (2008) and Fattouh (2007) agree that crude oil price elasticity is very low especially in the short run. This is due to technology lock-up; that is, it takes some time before energy-consuming appliances/capital stocks are replaced with more energy-efficient substitutes. However, substitution takes place in the long-run and price elasticity is thus much larger. Notwithstanding, price elasticity is yet less than one (Hamilton, 2008). Baumeister and Peerman (2009) further explain that the demand function is recently getting less elastic (probably due to increasing growth in demand from emerging economies, relative to availability of substitutes such as bio-fuels and green energies), and this explains higher shocks in oil prices. Similarly, supply of crude oil is price inelastic. This results from time lag between exploration and production activities, making supply less responsive to price changes (Fattouh, 2007).

Bedsides the decreasing elasticity of crude oil demand function, Baumeister and Peerman (2009) further posit that shifts in demand for oil explain some of the price volatility. These shifts result from economic growth in oil-importing countries, but Kilian (2006) notes that the shifts in global oil demand, and consequent surges in oil price, in the past few decades have been mostly due to shocks/changes in inventory/precautionary demand planning (against probable future oil scarcity) by oil importers. Hamilton (2009) however disagrees with Kilian (2006) that shifts in global oil demand and price is not due to precautionary demand for oil; rather, he argues that precautionary/inventory demand declines in periods of price increases, thus helping to moderate price surges rather than aggravating it. He concludes that positive inventory (a precautionary demand identified by

Kilian (2006)) occurs after oil price rise has dissipated: firms replenish their stock that had been earlier depleted during period of price rise. Thus, it prevents excessive price plunge and invariably moderates volatility.

Income elasticity also contributes to oil price volatility. Income elasticity higher than unity means that percentage rise in quantity demanded of oil is greater than percentage rise in income. Thus income variation causes demand for oil to shift in the same direction but at a higher magnitude, thus leading to oil price volatility. Reporting Darl (1991) Hamilton (2008) reports positive income elasticity for crude oil demand in developing countries from where most of the growth in world consumption of crude oil emanates. This agrees with Fattouh's (2007) report of Ibrahim and Hurst (1990) and Pesaran, Smith and Akiyama's (1998) estimated crude oil income elasticity for developing and Asian countries. However, shifts in supply function are mild except for periods of political disturbance in oil-producing countries. This points out that the current rising trend in oil price resulting from supply disruption may not be sustained. This thus bears a policy implication for governments in oil exporting countries with respect to tying budgetary plans too closely to crude oil revenues.

Baumeister and Peerman (2009) further identify shift in contractual arrangement from longer term to short term as another cause of volatility. They note that oil market transactions in 1960s were based on long-term contracts with predetermined price. Thus transition to the current market-based system of spot market trading would results in quicker translation of oil demand and supply variations into price changes.

Oil Price Shocks and Economic Activity: Exporting countries Vs Importing Countries

Sharp changes in oil price affect different countries differently, depending on whether the country in question is an exporter of crude oil or an importer. For an importer or a consumer nation, rise in price of oil, an input of production, raises the cost of production, and hence can lead to (cost-push) inflation, lower economic growth, and even recession (Sauter and Awerbuch, 2003; Barsky and Kilian, 2004; Mordi and Adebiyi, 2010). This was the case in the US between 1948 and 1981 (Hamilton, 1983). On the other hand, rise in oil price is beneficial to oil exporting countries as export receipt from a given quantity of oil increases (Deaton, 1999). On the other hand, decline in oil price may hurt them in terms of decline in foreign revenue, economic recession, and sometimes political instability (Zhang, Lai and Wang, 2007).

Are oil-exporting countries excluded from negative effects of oil price rise? It is evident that countries may benefit from additional income from commodity price booms; yet, the benefit may be limited due to the

DDS plague. Besides, removal of subsidies on petroleum products by many governments in net oil-exporting countries in pursuit of market-based efficiency is tying domestic prices of petroleum products to international crude oil prices (Baig et al, 2007). This implies that oil price rise/shocksfilters into their economies via domestic fuel prices. Thus, their economies may also be affected by oil price increase in a fashion similar to that of net oil importers.

Oil price rise is costly for the oil-importing economy, and neither does its decline benefit them (Atukeren, 2003). That is, price decline does not significantly improve the economy; whereas, oil price rise negatively impacts on the economy (Sauter and Awerbuch, 2003). This asymmetry is due to constraints placed on firms' adjustment to oil price shocks by resource reallocation effect. When oil price rises, sectors that use oil-intensive production processes decline. On the other hand sectors that are less dependent on oil relatively expand. The engendered reallocation of resources, coupled with market imperfection constrains reverse adjustment when oil price falls. Factors of production do not readily move between sectors, despite falling oil price and declining costs of production; and consequent expansion in the energy-intensive sector. The sector could thus not fully expand in response to a unit fall in oil price - as much as they shrank when oil price had risen by a unit. This shows that oil price changes (rise and fall in price) lead to overall output loss for oil-importing countries (Jimenez-Rodriquez and Sanchez, 2003).

Oil price movements are not beneficial to exporting countries either, due to similar asymmetric effect. Effects similar to those faced by oil-importing replicate themselves in oil-exporting countries given transmission of international price movement into domestic market (Baig et al, 2007). Price shocks are even worse when considered in the light of uncertainty effect on consumption and investment expenditures, and ultimately, the consequential output loss.

The Dutch Disease Syndrome

One of the impacts of oil price shocks on economic growth and performance of an oil exporting countries like Nigeria is the Dutch Disease Syndrome. Windfalls from sharp surge in oil price cannot sweep through a developing economy that is yet to be diversified and large enough to absorb the inflow without causing inflation. Resource pull effect and spending effect result when large inflow from oil export hits a less diversified economy (Mieiro and Ramos, 2010). The booming export sector (trading internationally) experiences rise in marginal productivity and thus pay factors employed relatively more than other sectors do. As a result, factor inputs/resources are pulled to the booming sector (oil/export sector) at the

expense of other tradable sectors (agriculture and manufacturing) and the non-tradable sector.   This results in direct de-industrialisation of the economy.

As a result, output of industrial sector declines while prices of domestic products rise. As domestic price level (P) rises, real exchange rate ε (EP/P*) rises, nominal exchange rate (E) and foreign price level (P*) remaining constant (Blanchard, 2004). The appreciation in the real exchange rate penalises exports of other tradable sectors as they become relatively more expensive in the international market, and hence less competitive (Mieiro and Ramos, 2010).

Nigerian Experience of the Dutch Disease Syndrome

The country's poor policy formulation results in structural imbalance of the economy. This imbalance refers to a situation where the non-oil sector declines while the oil sector booms. This phenomenon is termed the Dutch Disease Syndrome (DDS). Nigeria has been exhibiting this phenomenon since the 1970s (Table I shows). The relative boom of the oil sector encouraged excessive government spending (Budina and Wijnbergen, 2008); and this resulted in inflation and real exchange rate appreciation. As a result, the non-oil tradable sectors

Table 1: Sectoral Contribution to the Nigerian Gross Domestic Product (GDP)

Sector	1960	1970	1980	1990	2000	2002
Agriculture	64.1%	47.6%	30.8%	39.0%	35.7%	28.35%
Manufacturing	4.8%	8.2%	8.1%	8.2%	3.4%	5.5%
Crude Petroleum	0.3%	7.1%	22.0%	12.8%	47.5%	40.6%
Other	30.8%	37.1%	39.1%	40.0%	13.4%	25.55%

Source: Adedipe (2004): The impact of oil on Nigerian Economic formulation became less competitive; consequently, they declined in their contribution to GDP (Table 1) and foreign trade (Table 2).

Table 2: Nigeria Visible Trade

Sector	1970	1996	1998	2000	2002
Oil	32.9%	77.3%	67.3%	72.9%	64.6%
Non-oil	67.1%	22.7%	32.7%	27.1%	35.4%

Source: Adedipe (2004): The impact of oil on Nigerian Economic formulation

Weak Sectoral Linkage between Oil and Nigeria non-oil Industries

Ibrahim (2007) identifies weak linkage between the oil industry and other sectors in Nigeria. He blames this on the low level of technological development in the country. This results in limited growth of the downstream sector. As a result, the avenues through which downstream oil sector could have forward and backward linkages with other sectors are thus limited.

Consequently, growth differential in oil and non-oil sectors is inevitable, and may explain backward development of the economy.

Supporting this view, Ibrahim (2007), while reporting Fadil (1985), posits that when oil is not economically integrated with the rest of the economy, oil revenues tend to be divorced from the circular flow of income in the domestic economy. It would thus have no impact on growth and development.

Research Methodology

This section presents the methodology employed in analysing the impact of oil price shocks on growth of the Nigerian economy.

Model Specification

The research adopts traditional aggregate demand model (Sloman and Hinde, 2008; Blanchard, 2004), specified as follows:

$$Y = C + I + G + (X - M) \quad \ldots\ldots\ldots\ldots.. (i)$$

where:

Y = GDP;　　　　　　C = Aggregate Consumption;　　　I = Aggregate Investment

G = Government Expenditure;　　　X = Exports;　　　　M = Imports

Implicitly, equation *i* can be re-written as

$$Y_t = f(C_t, I_t, G_t, X_t, M_t) \ldots\ldots\ldots\ldots\ldots (ii)$$

Export is made up of oil exports and non-oil exports. Thus, the total export will be disaggregated accordingly.

$$Exports = Oil\ Export\ (oilX) + Non - oil\ Export\ (noilX) \quad \ldots\ldots\ldots\ldots (iii)$$

Nominal oil export is made up of the current oil price and quantity of crude exported (real oil export).

$$\therefore \quad Oil\ Export\ (oilX) = oilP_t * oilQ_t \quad\quad\quad \ldots\ldots\ldots\ldots (iv)$$

Combining identities i, ii, iii and iv produces:

$$Y_t = f(C_t, I_t, G_t, noilX_t, oilP_t, oilQ_t, M_t) \quad \ldots\ldots\ldots\ldots\ldots (v)$$

Specifying identity (v) in a log linear form for reason of the ease of interpretation (Kabir, 1988) yields:

$$\ln Y_t = \beta_0 + \beta_1 \ln C_t + \beta_2 \ln I_t + \beta_3 \ln G_t + \beta_4 \ln X_t^{noil}$$
$$+ \beta_5 \ln P_t^{oil} + \beta_6 \ln Q_t^{oil} + \beta_7 \ln M_t \quad \ldots\ldots\ldots (vi)$$

The usefulness of this transformation is many: it minimises the huge differences in the magnitude of different variables, thereby brings out the coefficient of co-variation better; the interpretation of the result is in the form of elasticity, a much easily understandable interpretation devoid of complication from measurement unit; and more importantly, the impact of the explanatory variable on the dependent variable is that of the influence of the former on economic growth.

To examine the influence of oil price shock, a variable capturing this effect is included in equation vi above; hence we have:

$$\ln Y_t = \beta_0 + \beta_1 \ln C_t + \beta_2 \ln I_t + \beta_3 \ln G_t + \beta_4 \ln X_t^{noil}$$
$$+ \beta_5 \ln P_t^{oil} + \beta_6 \ln PS_t^{oil} + \beta_7 \ln Q_t^{oil}{}_t + \beta_8 \ln M_t \quad ....(vii)$$

The variable PS_t^{oil} is computed following Devereux and Sutherland's (2009) study which conceptualises shock, v, to a variable, X, as produced from the following AR1 process:

$$\hat{X}_t = \psi \hat{X}_{t-1} + v_t \quad ....viii$$

Where: $\qquad\qquad\qquad \hat{X}_t = \ln X_t - \ln \overline{X} \quad ....ix$

and

$\overline{X}$ = non-stochastic value of X.

Using equation (*ix*) in equation (*viii*) implies:

$$v_t = X_t - \omega \overline{X} - \psi X_{t-1} \quad .... x^{77}$$

v_t is recovered as residual from regression of the variable on its mean and lagged value. In this case, PS_t^{oil} for the oil price variable is recovered from regression of the variable on its mean and lagged value each of the oil price.

Estimation

Both equations vi and vii are estimated using the general methods of moments. The choice of this technique is informed by its ability to take care of any endogeneity problems that the equation may suffer from. However, the robustness of the estimation is checked by estimation the equation using ordinary least squares and two stage least square estimation techniques.

Diagnostic Tests

This study employs a battery of econometric tests to examine the reliability of analytical results. Such include the unit root test and Co-integration test

Group unit root tests

Unit root tests will be carried out to examine the stationarity of the variables in the model. Should all the variables be stationary, that is being of order I(0) estimation of the long-term relationships between the variable may suffice. If not, the existence of long-term relationship may have to be sought for, and established, via cointegration tests on the variables.

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[77] Where: $\omega = (1 - \psi)$

Cointegration test

Johansen system cointegration test is employed to determine the existence of co-integration between the predictand and the predictors, on the basis of which the relationships can be estimated regardless of non-stationarity (Holly and Turner, 2010), once the unit roots test (above) shows that at least one of the variables is non-stationary. The test is necessary to establish the existence of any long-run relationships between the variables of interest even if any of them is non-stationary. Existence of cointegration between the variables in a case where any of the variables is not stationary allows for estimation of long term relationship between the variables.

Data Collection

The data employed are sourced from Energy Information Administration; National Bureau of Statistic, Nigeria and the Central Bank of Nigeria.

Data on oil price and export of crude oil and petroleum products are sourced from the annual statistical bulletins of Organisation for Petroleum Exporting countries OPEC. Data on aggregate consumption, investment, government spending, non-oil export and import are collected from the Central Bank of Nigeria database.

Empirical Evidence

Following the methodology earlier presented, this section presents research findings from analyses of the relationships between oil price shocks and economic growth in Nigeria.

Diagnostic Tests Results

Various diagnostic tests carried out to verify the validity of econometric analyses and reliability of their findings are presented below

Unit roots test results

The ADF- Fisher and the PP-Fisher statistics of group unit root test show that not all the individual series are stationary at level. They however reveal that all the series are stationary at first difference

Johansen system co-integration tests results

The Johansen system co-integration tests results show there exist some long run relationship between the variables as the tests reject the null hypothesis that there is no cointegrating equation connecting the variables.

Empirical Results

The impact of oil price shocks as well as other macroeconomic variables on economic output growth is presented in table 3 below. The estimations of equation vii by OLS, 2SLS and GMM are presented in column 1, 3 and 5 respectively while those of equations vii are presented in column 2, 4 and 6 respectively.

Table 3: Economic Growth and Oil Price Shocks

Dependent variable	ln (GDP)					
Model	OLS		2SLS		GMM	
Independent Variables	1	2	3	4	5	6
ln (consumption)	0.420*** (0.000)	0.418*** (0.000)	0.439** (0.030)	0.433* (0.051)	0.510*** (0.000)	0.501*** (0.000)
In (investment)	0.037 (0.485)	0.035 (0.529)	0.042 (0.523)	0.039 (0.592)	0.050 (0.300)	0.046 (0.425)
ln (government spending)	0.155*** (0.001)	0.154*** (0.002)	0.150** (0.018)	0.150** (0.020)	0.134*** (0.001)	0.135*** (0.001)
ln (non-oil export)	0.066* (0.056)	0.064* (0.084)	0.063 (0.142)	0.062 (0.141)	0.045 (0.180)	0.045 (0.167)
ln (oil export)	0.161* (0.099)	0.159 (0.112)	0.163* (0.055)	0.161* (0.06)	0.169*** (0.000)	0.167*** (0.000)
ln (oil price)	0.162*** (0.000)	0.162*** (0.006)	0.153*** (0.002)	0.158** (0.035)	0.144*** (0.000)	0.151** (0.025)
Oil price shock		-0.008 (0.908)		-0.006 (0.924)		-0.009 (0.894)
ln (import)	0.053 (0.264)	0.054 (0.274)	0.047 (0.523)	0.049 (0.136)	0.027 (0.547)	0.030 (0.586)
Constant	2.493*** (0.004)	2.525*** (0.006)	2.367* (0.096)	2.421 (0.136)	1.964** (0.022)	2.043** (0.045)
F/χ^2 Statistic	202.12	169.6	1857	1857	2018	2715
$P(F/\chi^2$ Statistic)	0.000	0.000	0.000	0.000	0.000	0.000
R^2	98.33%	97.75%	98.33%	98.33%	98.25%	98.26%
Adj. R^2	97.85	97.75				

Source: authors' calculation

The results in the table above show the models specified significantly explain economic growth as variation in the regressors explain more than 97% variation in the predictand[78]. Moreover, the probability value of the F/χ^2 Statistic attests to statistical significance of the explanatory power of the model. Furthermore, the models are robust to endogeneity problem as the result of the OLS agrees with that of 2SLS and GMM.

Consumption and government spending positively affect growth at conventional statistical levels of significance (1% and 5%) in all the estimations except in column 4 where consumption is only significant at 10%. This agrees with the traditional role that these components of aggregate demand play on output. Though variation investment is positively related to

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[78] Variation or change in natural logarithm of GDP is economic growth

growth, the impact is not statistically significant at conventional levels. This may be explained by poor productively of capital in a developing country like Nigeria.

While non-oil export insignificantly affect growth positively, perhaps due to poor non-oil export in the country resulting from dominance by crude oil export, oil export significantly translate to higher growth at conventional statistical levels of significance, at least in equations 5 and 6.

Oil price significantly affect economic growth in all the estimations at conventional levels. This is due to the fact that higher oil prices translate to higher revenue/income for the economy which provides additional resources that can be used to promote economic growth.

On the other hands, oil price shock negatively affects the economy, though its impacts are not statistically significant at conventional levels in all the estimation. The negative impacts may be explained from the uncertainty that shock introduces in the economy and its impact on the government budget. Oil price shocks often destabilise government fiscal operations, which may in turn negatively affect other economic plans and outcomes. While negative shock may result in cut in planned government expenditures (e.g. on infrastructure) positive shocks may overheat the economy as government may expand its fiscal operations to mop up the excess revenues.

The impact of oil price shocks on economic growth here disagrees with Ikla et al. (2012), Mordi and Adebiyi (2010) and Aliyu (2009), many of which did not account for the direct impact of oil price itself on economic growth. Once the impact of price on additional resources provided through oil export is taken into consideration, the effect of surges in oil price is negative, though statistically insignificant. The results of some of these studies are erroneous on measurement basis. For instance, Aliyu (2009) report the effect of oil price as that of its shock: he measured oil price shock as the average quarterly price of internationally traded variety of crude. The positive effect of oil price on economic growth was thus mistaken for that of oil price shocks.

Conclusion and Recommendations

The literature is awash with the unceremonious relationship between Nigerian oil resource and her economy. The nation is yet to succeed at breaking the chain of poverty despite her abundant endowment of oil resource. The problem is caused by many factors. However, the focus of this research is identification of the impact of oil price shocks on the growth of the Nigerian economy.

This study finds that oil price shocks do not have a positive impact on the economy (in contrary to the findings of some earlier studies) but oil price itself does. While increase in price positively affect the economy through its

contribution to export revenues (and government revenues), surges in oil price induce or worsen uncertainty in the economy through its effect on fiscal instability and vulnerability of budget implementation.

This negatively affects the economy, though not to a statistically significant extent, as this study finds out. The reason for this is that, in spite of numerous problems facing the nation (locally and globally - among the global factors is the fluctuations in oil prices arising from global events), the country's GDP has been, virtually always, on the rise; and the Nigerian economic growth has not suffered any set back.

Notwithstanding, the country should diversify its export revenue base as a means of minimising reliance on crude oil and petroleum product. This will further shield the economy from the impact of oil price shocks on the economy, and thus prevent the negative effect of the shocks from attaining a statistical significance level.

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