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OIL PRICE SHOCKS AND GOVERNMENT SPENDING BEHAVIOUR IN NIGERIA

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Abstract

This study, therefore, examined oil price shocks and government spending in Nigeria between 1970 and 2017. While there is a growing body of literature on the macroeconomic effects of oil price volatility, little attention has been devoted to its effects on government spending. The multivariate vector Auto regression model was explored for the empirical investigation. Our findings reveal that Government spending responds positively to net, scaled, positive and negative oil price changes and the attendant shocks. Price volatility and shock effects on government expenditure response were significant for the first two years and thereafter fizzled out as the impulse responses of government spending revert to zero within six years. Thus, the effects of price volatility and shocks are transitory. Variance decomposition indicates that price volatility had no initial impact on government spending but increased to 14.9% in the medium-term (5th-10th year) and further to 15.0% in the long-run (10th year and above). Price volatility contributes less than 5.0% to the variations in other macroeconomic variables in the short-run but up to 5.5% and 5.8% in the medium-term and long-run, respectively. Oil price volatility has greater influence on the fiscal behaviour of the government than discount rate shocks. The asymmetric effects of the price volatility and shocks were insignificant.

Keywords: *Oil price shocks, Government spending behavior Fiscal, Generalised impulse response function, Nigerian Government*

INTRODUCTION

Since the discovery of oil in commercial quantity in Nigeria in 1956 and the oil boom of 1970s, oil has dominated the economy of the Nigeria country. Oil accounts for more than 80% of government total revenue and about 65% of budgetary revenue. Iwayemi and Fowowe (2011) are of the view that the economy has witnessed unstable changes as a

result of over dependence on foreign inflow from crude oil earnings which constantly experience price shocks. The oil boom of the 1970s led to the neglect of agriculture and other non-oil tax revenue sector, expansion of the public sector, and deterioration in fiscal discipline and accountability of public funds. In turn, oil-dependence exposed Nigeria to the vagaries associated with oil price shocks which threw the country's public finance into disarray (Aliyu, 2009).

Understanding the concept of shocks in oil price is increasingly gaining prominence both in theory and practice. The reasons for this development are obvious; oil price data are available at a high frequency and therefore, there is increasing evidence of the presence of statistically significant correlations between observations that are large distance apart; and also in connection with the high frequency of oil price data, there is possibility of time varying volatility (referred to as conditional Heteroscedasticity) (see Harris and Sollis, 2004). More practically, variability in the oil price implies huge losses or gains to oil producing and exporting nations particularly the oil dependent economies and hence is confronted with economic instability and huge losses or gains to independent investors in the oil markets and hence they are confronted with greater uncertainty. Thus, both the government and profit-maximizing investors are keenly interested in the extent of socks in oil price to make policy/investment decisions. Therefore, a measure of shocks in oil price provides useful information both to the investors in terms of how to make investment decisions and relevant authorities in terms of how to formulate appropriate policies.

Since oil revenue dominates Nigeria's Federation account, the changes in oil prices, hence offer a good platform to study government spending behaviour in the Nigerian economy for several reasons (Omo & Ismail, 2017). The budgetary impact of this shock in oil price is considerably larger than those of the shocks to the public budget from aid, loans, grants and remittances commonly studied in the public finance literature (Wyckoff, 1991; Hines and Thaler, 1995). Second, oil price shocks have been positive and negative. The result allows testing further on possible asymmetries in the government spending behaviour (Hamilton, 1983; Videgaray-Caso, 1998 and Pieschanon, 2012).

It is therefore imperative that the spending behaviour of government to oil price volatility is by itself of great interest to the Nigerian government, as oil price shocks operates first through the government spending channel.

Given that oil is the main source of export revenues for Nigeria, unanticipated changes in oil price might affect the behaviour of other macroeconomic aggregates such as inflation, money supply, exchange rate, real Gross Domestic Product. More importantly, since the price of oil is exogenously determined, it is possible that unprecedented movement in this price might influence its exchange rate which passes through the stability of other commodity prices in the country. Positive oil price shocks should lead to a real appreciation (depreciation) of the exchange rates of oil-exporting (importing) economies, whereas the reverse is the case for negative oil price shocks.

Following a recent study done by Babatunde (2015), the price of oil has generally been relatively stable from mid-1980s to 2004, swinging between an average of US$30 and US$40, intermittently, there are noticeable variation with large increases and decreases in revenue inflow because of several factors such as an unprecedented change in oil price in 1973/1974 and Gulf War in 1991. For instance, oil price increased by 76 per cent between March 2007 and June 2008 and decreased by 48 per cent between July 2008 (when the price peaked at US$147 per barrel) and October 2008. Subsequently, it fell to US$31 per barrel by the end of December 2008. These large oil price shocks could very well be the principal external factor that contributed to the variation of the exchange rate movements. This is because exchange rate of the Naira to the US dollar depreciated by 7.4 per cent from US$117.7 to US$126.4 between July and December 2008. This further depreciated by 19.5 per cent to US$151 by August 2009. These wide fluctuations of oil price have implications for government revenue, inflation and foreign exchange earnings in Nigeria.

These concerns raise the following fundamental questions which are pursued in this study; what has been the spending behaviour response to oil price shocks in the Nigerian economy? How has monetary policy effect affected the fiscal behaviour relative to oil price volatility? Do asymmetric effects of oil price shocks influence the government spending behaviour in Nigeria?

Research Objectives

The study aims to contribute to knowledge in the area of government spending behaviour in response to oil price shocks through extant review of empirical and analytical process. Therefore, the objectives are to find out whether:

i What has been government spending response to oil price shocks in Nigeria

ii To access the impact of monetary policy on government spending in relation to oil price volatility.

iii To determine whether asymmetric effect of oil price shocks influence government spending

Hypotheses

$H0_1$: Oil price shocks does not affect government spending

$H0_2$: Monetary policy does not affect government spending

REVIEW OF LITERATURE

Studying the role of oil price shocks in macroeconomic dynamics came to the focal point of research since 1970s. Chen, Liu, Wang and Zhu (2016) research on the effect of oil price changes on the U.S dollar changes as regards bilateral as against sixteen OECD countries. The result shows that exchange rate responses differ significantly subject to either change in prices of oil are driven by forces of demand or supply. The study further

reveal that oil prices socks account for 10% to 20% of changes in exchange rate. Nursair (2016) Deploys nonlinear cointegrating autoregressive distribution lag on the impact of oil price shocks on the Real Gross Domestic Product on the economies of Gulf Corporation Council. The outcome suggests presence of asymmetries. The result also suggested that a significant and positive relationship exist between oil price and real GDP. Hamdi and Sbia (2013) investigate the dynamic relationships that exist between oil price shocks and various categories of Iranian Government spending. Impulse response function and various decomposition techniques were used in the analysis of the variables.

It is evident from the analysis that Iranian government spending respond positively and significant to oil price shocks with regards military expenditure while social spending which is also part of government spending does not show significant response to oil price shocks. In a similar study, Dizaji (2014) study the relationship that exist between government inflow and outflow in a developing country of Iran. The study centered on how oil prices and oil prices shocks could impact on government expenditure. The result of the analysis suggested that the impact of oil revenue shocks in justifying government expenditure is significant. In a similar study, Fasanya (2013) investigates fiscal response of government to oil price volatility in Nigeria. The study covers the period of 43 years. Multivarite VAR model was explored for the study. The findings from that oil prices has direct impact on government spending, while inflation and discount rate differential has no asymmetric effect on government spending.

The analysis of the impacts of oil price shocks has been extended to countries other than U.S. only recently. Cunado and Gracia (2003) concentrate on the effects of oil price shocks on the industrial production and consumer price indices for 14 European countries. Jimenez-Rodriguez and Sanchez (2005) carry out multivariate regressions for 8 countries (the G-7 countries plus Norway) in order to account for the inverse relationship between GDP and oil prices. Huang et al. (2005) apply a multivariate threshold model to investigate the impacts of oil price changes and their volatility on economic activity. Kilian (2005) estimates the effects of exogenous shocks to global oil production on the most industrialized countries. For instance, Al-Mutairi (1993) claimed that dependence of the government spending policy on oil price significantly affects output movements in Kuwait. In addition, Eltony (2001) approved the causal relationship from oil revenues towards other macroeconomic variables in Kuwait. He also identified the government's fiscal stimuli as the main determinant of domestic prices.

Dibooğlu and Aleisa (2004), investigating the sources of macroeconomic fluctuations in Saudi Arabia using Structural VAR method, showed that price level, real exchange rate, and to a lesser extent output is vulnerable to terms of trade shocks which are driven by output, trade balance, and aggregate demand shocks. In the case of Venezuela, El Anshasy et al. (2005) investigated the relationship between oil prices, government revenues, government consumption spending, GDP and investment by a VAR/VECM model and concluded that fiscal balance in both short and long run affects economic growth.

Papaetrou (2001) on the other hand tests the dynamic linkage between crude oil price and employment in Greece using industrial production and industrial employment as alternative measures of economic activity. The study is modeled in a cointegrated VAR framework and extends out by looking at the generalized variance decomposition and impulse response functions, which is very encouraging as most studies have not gone beyond cointegration and error corrections modeling.

Quality number of studies have also been carried out in Nigeria, however, only some of them included aggregated government spending in their analysis which is a departure from the issue of concern; see, for instance, Iwayemi and Fowowe (2011) examined an empirical analysis of the effects of oil price shocks on a developing oil-exporter country, Nigeria, using quarterly data from 1985 to 2007. Their findings suggest that oil price shocks do not have a major impact on most macroeconomic variables in Nigeria. The results of the Granger-causality tests, impulse response functions, and variance decomposition analysis all showed that different measures of linear and positive oil shocks have not caused output, government expenditure, inflation, and the real exchange rate. The tests supported the existence of asymmetric effects of oil price shocks because the study found that negative oil shocks significantly cause output and the real exchange rate.

Chuku et al. (2011) examined the role of oil price shocks in the dynamics of current account balance using quarterly data from 1970-2008. They observed that oil price shocks have a significant short run effect on current account balances for Nigeria. Olomola and Adejumo (2006) who examined the effects of oil price shocks on Nigeria macroeconomic fundamentals. They found that oil price shocks significantly affect the money supply in the long run and concluded that their results suggested the tendency for the Dutch disease. Babatunde et al. (2013) reveals that stock market returns in Nigeria exhibit insignificant positive response to oil price shocks but reverts to negative effects after a period of time depending on the nature of the oil price shocks. The results are similar even with the inclusion of other variables.

Also, the asymmetric effect of oil price shocks on the Nigerian stock returns indices is not supported by statistical evidences. In another study by Babatunde (2015) on the impact of oil price shocks on the exchange rate in Nigeria, indicate different responses for the exchange rate with respect to positive and negative oil price shocks. Positive oil price shocks were found to depreciate the exchange rate, whereas negative oil price shocks appreciate the exchange rate. In addition, the asymmetric effects of positive and negative oil price shocks on the real exchange rate were not supported by the statistical evidences.

The results from the previous studies were robust, however, most of the studies carries out in the developing country especially Nigeria does not indicate effect of oil price volatility on government spending as well as checking for the asymmetry effect of oil price shocks, which is a major thrust of this study. It is however important to note that most of

the empirical studies reviewed suggest reviewed mostly concentrate on developed economy. By this, the policy relevance of this research work in Nigeria is carried out.

THEORETICAL FRAMEWORK

The main prediction of this theory is that fiscal policy is procyclical similar to the Neoclassical. However, finite lifetimes define the major difference between Neoclassical and Ricardian Equivalence paradigms. In particular, the model demonstrates that government spending increases in booms and decreases during recessions, whereas tax rates decrease during booms and increase in recessions. In other words, the theory predicts that government spending as share of GDP should be neutral over the cycle and that tax revenue as percentage of GDP should be negatively correlated with changes of GDP.

The Ricardian Equivalence hypothesis enunciates the effects of the government's choice between taxes and bonds. It argues that when there are taxes, the representative household's budget constraint is such that the present value of its consumption cannot exceed its initial wealth plus the present value of its after tax labour income. Further, a variation in budget deficit is neutral to economic activity, as in the face of rising budget deficit, taking consideration the interests of future generations, which would increase saving so as to provide for the higher tax burden in the future, offsetting the likely impact of budget deficit on macro-economy.

The focus of the Ricardian equivalence in the literature is on the effects of cuts in lump-sum taxes for a given path of government spending. With proportional or progressive taxes, the way in which the supply-side effects of tax cuts affect permanent income also have to be taken into consideration. If a fiscal expansion takes the form of increased government spending, the impact on the permanent income depends on how this will be paid for in the future. A temporary increase in government spending that will be offset by cuts in future spending will have no impact. However, an increase in government spending financed by higher future taxes will lead to a reduction in permanent income and therefore possibly negative fiscal multipliers although the precise extent of the resulting fall in output will depend on the productivity of the government spending.

METHODOLOGY

The study utilized secondary data from different data bank. Data for the variables are sourced from World Development Indicator (2018), Central Bank of Nigeria Statistical Bulletin (2018), Nigerian Bureau of Statistics (NBS, 2018), Thomson Reuters and E1A annual reports. The study used monthly data for Brent oil price and annual data for other variables but the Brent oil price was later converted to annual data using simple average method.

The oil price is measured in real terms as the product of Brent oil price and exchange rate (Naira per US dollar) deflated by the consumer price index (CPI). All variables are measured in logarithms. The sample period runs from 1970 to 2017. The scope of the study was based on data availability. Data on the monthly nominal exchange rate of the Naira to

US dollar and the CPI were obtained from the Statistical Bulletin published by the Central Bank of Nigeria. The rate of inflation, total government expenditure, discount rates, and non-oil GDP are obtained from the Central Bank of Nigeria Statistical Bulletin and Nigerian Bureau of Statistics. All are annual frequency data.

The world's crude oil prices (Brent) for the extended period 1970-2017 were obtained from the US Energy Information Administration. The monthly frequency data is used to construct the annual Net Oil Prices Increase (NOPI) as a measure of oil price volatility and the asymmetry of oil price changes. The monthly frequency is also used to construct the conditional variance. The conditional standard deviation of oil prices, our measure of oil price volatility called Scaled Oil Prices Increase (SOPI), is obtained by employing a GARCH (1, 1) model. Lastly, in order to obtain the measure of oil price volatility to be used in the estimation we transformed the monthly conditional standard deviation from the GARCH model into a yearly-frequency. Every yearly observation is a 12 month simple average.

Table 4.1 provides the definitions and measurement of the variables used in the empirical investigation.

Table 4.1: Definitions and Sources of Variables

Variable (s)	Definition	Measurement	Source
(GEXP)	Growth in government Spending. Measured by the log difference of total government expenditure as a percentage of GDP	Millions (#)	CBN (2018)
	Discount rate differential between the household and the government. Lending rate is used for household discount rate while Monetary Policy Rate (MPR) is used for government discount rate, all in logarithm form.	Rates	CBN (2018)
	Non- oil sector growth- Measured by the log difference of Non-oil GDP as a percentage of total GDP	Millions (#)	NBS(2018)
	Oil price shock measured by the log difference of real crude oil prices. Using net oil price increase (NOPI)	US Dollar/Barrel	EIA (2018)
	Conditional Standard Deviation from a GARCH (1,1) model of real oil price	US Dollar/Barrel	EIA (2018)
	Skewness (Asymmetry) in real oil price changes. This is composed of positive oil price (OIL_PV) and negative oil price changes (OIL_NV).	US Dollar/Barrel	EIA (2018)

INF	Inflation, measured by log difference of CPI	Rates	CBN (2018)

Source: Author's Compilation (2018)

EMPIRICAL MODEL

The model provides guidance for determining the set of relevant variables to include in an empirical investigation of fiscal spending behaviour of government in Nigeria. In addition, it provides useful insight into how the spending of an optimizing government would respond to volatility in oil prices. From the theoretical expository, it is believed that the model produces three classes of variables that affect the growth in government spending. These include discount rate differential between the household and the government (), non-oil sector growth (nos- private sector activities) and lastly is the set of variables associated with oil prices[1]. These set of oil price variables explains the channels through which oil price affects fiscal policy. This transmission mechanism follows that:

i Unanticipated changes in oil price (positive or negative) can either spur or drag total revenue. A positive oil price shock (+ve) is expected to offshoot government total revenue (Y) and later stimulates increase in government expenditure (G). The positive shock in oil price can also induce private sector activities thereby leading to improved growth in the private sector through the level of investment (I), hence, increasing the level of spending by the government. However, the opposite is likely for a negative oil shock.

ii The transmission process for oil volatility is ambiguous. Oil price volatility can either increase or decrease government expenditure. Oil price variance is composed of two potential offsetting effects and the effect determine by the relative size of these opposite factors:

- If government faces future liquidity constraints, it can raise public savings which lead to decrease in government spending, however, volatile government expenditure is costly if government is risk-averse.
- Private sector faces exposure to risk and may go government securities thereby leading to increase in government expenditure.

iii Another possible transmission is the skewness in oil price. If positive oil shock is less than negative oil shock, government may be optimistic and endure the negative shock with the hope that it will turn positive thereafter stimulating the level of government expenditure.

The empirical model can, therefore, be expressed as follows:

Pre Estimation Analysis

Descriptive Statistics of the Variables

This sub-section discusses the statistical properties of the variables. Thus, the univariate statistics of the variables, which include the mean, median, skewness, Jarque-Bera, Kurtosis, among others are reported. Table 1.0 presents the descriptive statistics for all the variables over the full sample period. The mean in the table represents the average value of each variable over the considered time period. On average, all the variables considered in the study except government spending and negative oil price shocks have positive average values which imply a procyclical fiscal policy, hence, the role of movements in oil prices drives the pattern of spending by the government.

The maximum and minimum values including the skewness and kurtosis statistics of the variables are also presented. The skewness is a measure of the symmetry of the histogram. The rule of thumb for any standardized normal variable is that, both its mean value and skewness should be zero. A variable with negative skewness is said to be far below the mean, while a variable with positive skewness is usually above the mean.The variables are all positively skewed with the exemption of the negative oil price shocks which is expected as a result of capturing period of negative movements in oil prices. The kurtosis statistics also reveal that all the variables under study are highly peaked or leptokurtic. Similarly, the Jarque Bera (JB) statistic that uses the information from skewness and kurtosis to test for normality shows evidence of non-normality for all variables under the whole sample period. In summary, the descriptive statistics revealed that the data sets are not normally distributed except for government expenditure.

EMPIRICAL RESULTS AND ANALYSIS

Table 1.0: Summary Statistics of the Variables

Statistics	GEXP	DLNOS	L_DR	OIL_LINEAR	NOPI	SOPI	OIL_PV	OIL_NV	INF
Mean	-0.010	0.058	0.008	0.001	0.010	0.004	0.016	-0.015	20.566
Maximum	0.232	1.420	0.508	0.088	0.078	0.053	0.092	-0.001	72.756
Minimum	-0.287	-0.133	-0.234	-0.031	0.000	0.001	0.001	-0.041	5.717
Std. Dev.	0.114	0.244	0.160	0.020	0.014	0.008	0.016	0.009	17.790
Skewness	0.117	5.274	0.997	2.246	3.510	5.062	3.253	-1.092	1.602
Kurtosis	3.237	29.918	4.259	11.072	17.418	28.173	15.841	3.888	4.291
Jarque-Bera	0.1(0.9)	1184.1(0.0)	7.8(0.0)	120.8(0.0)	364.3(0.0)	1042.9(0.0)	293.6(0.0)	7.8(0.0)	16.9(0.0)

Source: Author's Calculations, (2018)

Figures in brackets are probability values.

Graphical Analysis of Model Variables

The behaviour of the variables is further analysed using graphical illustrations. Figure 1.0 illustrates the dynamics of the variables considered. The behaviour of the various specification of oil price volatility follow an unsteady pattern suggesting evidence of volatility clustering, i.e., periods of high volatility are followed by periods of relatively low volatility. The notable spikes are evidence of significant unsteady patterns of oil price volatility specification particularly during Asian financial crisis and the global financial crisis (with notable spike around 1999 as a result of uprise in the Middle East) and discount rate – government expenditure nexus with mixed behaviour. This observation also confirms the evidence indicating that the highest point volatility occurs during the Asian financial crisis and the global financial crisis. Overall, very few points on the graph hover around zero which further reinforces the observations in Table 1.0 with the volatility trends in oil prices showing evidence variations in their various specifications. Another interesting observation is the relationship between each of the specifications of oil price volatility and government expenditure over the sample period. There are co-movements between government spending and each specification of oil price volatility suggesting evidence of pro cyclical fiscal policy.

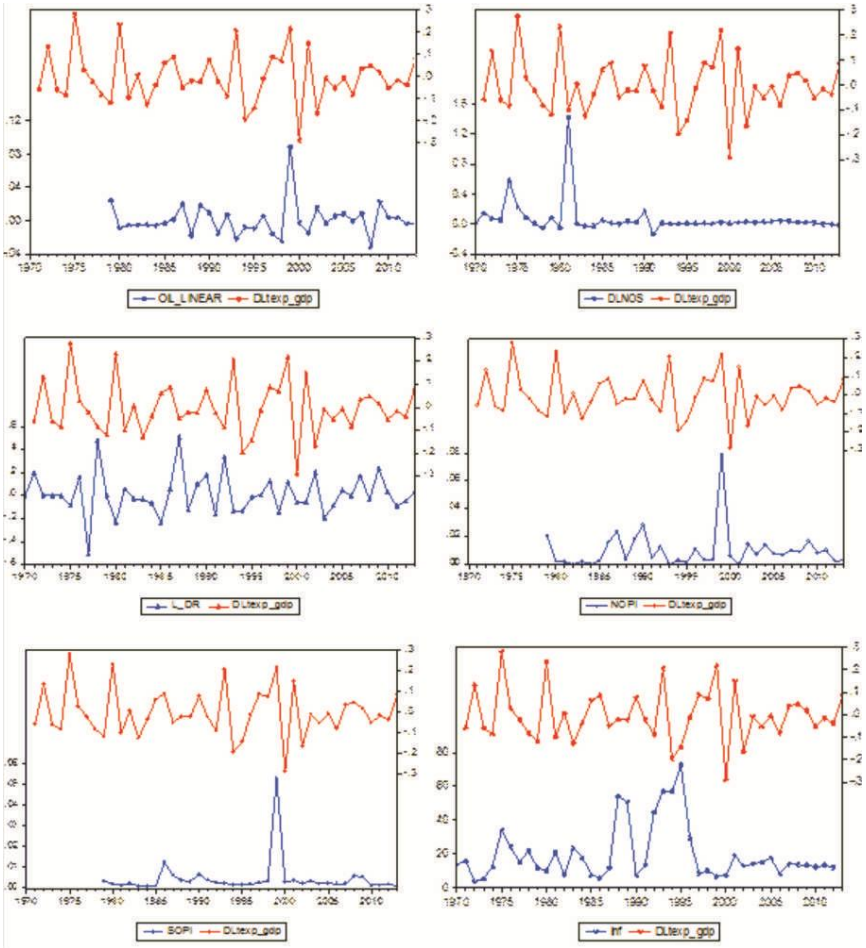

Figure 5.0:Variable Plots 1970-2017

Table 5.2: Dickey-Fuller Test with GLS Detrending (DFGLS) unit root test results

Variables	Constant (Model 1)		Constant and Linear Trend (Model 2)		Order of Integration
	Levels	First Diff.	Levels	First Diff.	
Govt. spending (GEXP)	-9.085*	-0.621	-9.057*	-12.214*	I(0)
Non-oil growth (NOS)	-6.622*	-10.729*	-7.106*	-11.237*	I(0)
Discount rate differential (DR)	-10.01*	-0.714	-10.01*	-9.483*	I(0)
OIL_LINEAR	-6.412*	-8.414*	-7.298*	-7.183*	I(0)
NOPI	-5.755*	-8.050*	-5.910*	-6.782*	I(0)
SOPI	-5.723*	-9.614*	-5.748*	-9.640*	I(0)
OIL_PV	-5.656*	-7.902*	-5.718*	-6.753*	I(0)
OIL_NV	-2.785*	-9.836*	-7.283*	-11.317*	I(0)
Asymptotic Critical Values:					
1%	**-2.634**	**-2.636**	**-3.770**	**-3.770**	
5%	**-1.951**	**-1.951**	**-3.190**	**-3.190**	
10%	**-1.610**	**-1.610**	**-2.890**	**-2.890**	

Source: Author's Calculations, (2018)

Note: The Null Hypothesis is the presence of unit root. Model 1 includes a constant, Model 2 includes a constant and a linear time trend . *,**,***, significant at 1%, 5%, and 10% respectively. Lag length selected based on Schwarz information criterion (SIC). The Elliott-Rothenberg-Stock DF-GLS test statistics are report

Impulse Response Analysis

In this section,the study explored the Generalized Impulse Response Functions (GIRF). Runkle (1987) emphasizes the construction and report of confidence bands around the impulse responses in the VAR models. The middle line in impulse response functions (IRFs) displays the response of different government expenditures to a one standard

deviation shock in oil prices. The dotted lines represent confidence bands. When the horizontal line in the IRFs falls between confidence bands, the impulse responses are not statistically significant. In other words, the null hypothesis of "no effects of oil price volatility" on the specific government expenditure cannot be rejected (Berument et al., 2010). The horizontal line in IRFs shows the time period after the initial shock. The vertical line in IRFs shows the magnitude of response to shocks.Figures5.1-5.5 show the generalized impulse response function curves simulated by analytic method, based on the five specifications of oil price using the VAR model. The research work considered the response of government spending from one standard deviation innovation to oil price measured by the log first difference of real oil price. Results for aggregate expenditure and other categorical expenditures and 95% confidence bounds around orthogonalized impulse response are shown.

For most expenditure, the impacts of oil price volatility are statistically significant at 5% level for the first 2 years after the shock with an exception of capital expenditure. All the orthogonalized impulse responses revert to zero within 6 years, which means the impact of oil price shocks is transitory. Another interesting exception is the linear specification of oil price where total expenditure is not statistically significant at 5% compared to the other specification of oil price volatility. The analysis revealed that the government spending responds positively to net oil price increase, standardized oil price increase and positive oil price shocks. As the major source of revenue, Nigeria's expenditure improves in response to the different shocks from oil prices. This is expected since negative supply shocks or positive demand shocks in the crude oil market improves the oil trade balance of the Nigerian government, to the extent that such shocks increase the price of oil thus increases revenue. Taken together, these findings show that the oil price volatility is a main driver of the Nigerian total and recurrent spending, while it has no effect on other groups of social expenditures such as capital expenditures[2]. Our result is consistent with the works Farzanegan (2011) and El Anshasy and Bradley (2012) for Iran and net oil exporting countries respectively, who argue that net oil-exporting countries should benefit from oil price hikes. Moreover, the positive gains from slightly higher oil prices can also offset any adverse impact to the economy. This is accomplished through pump priming, whereby revenues from higher oil prices can be channeled back into the domestic economy through government expenditure in the form of fuel subsidies and later increase others sectors output contribution.

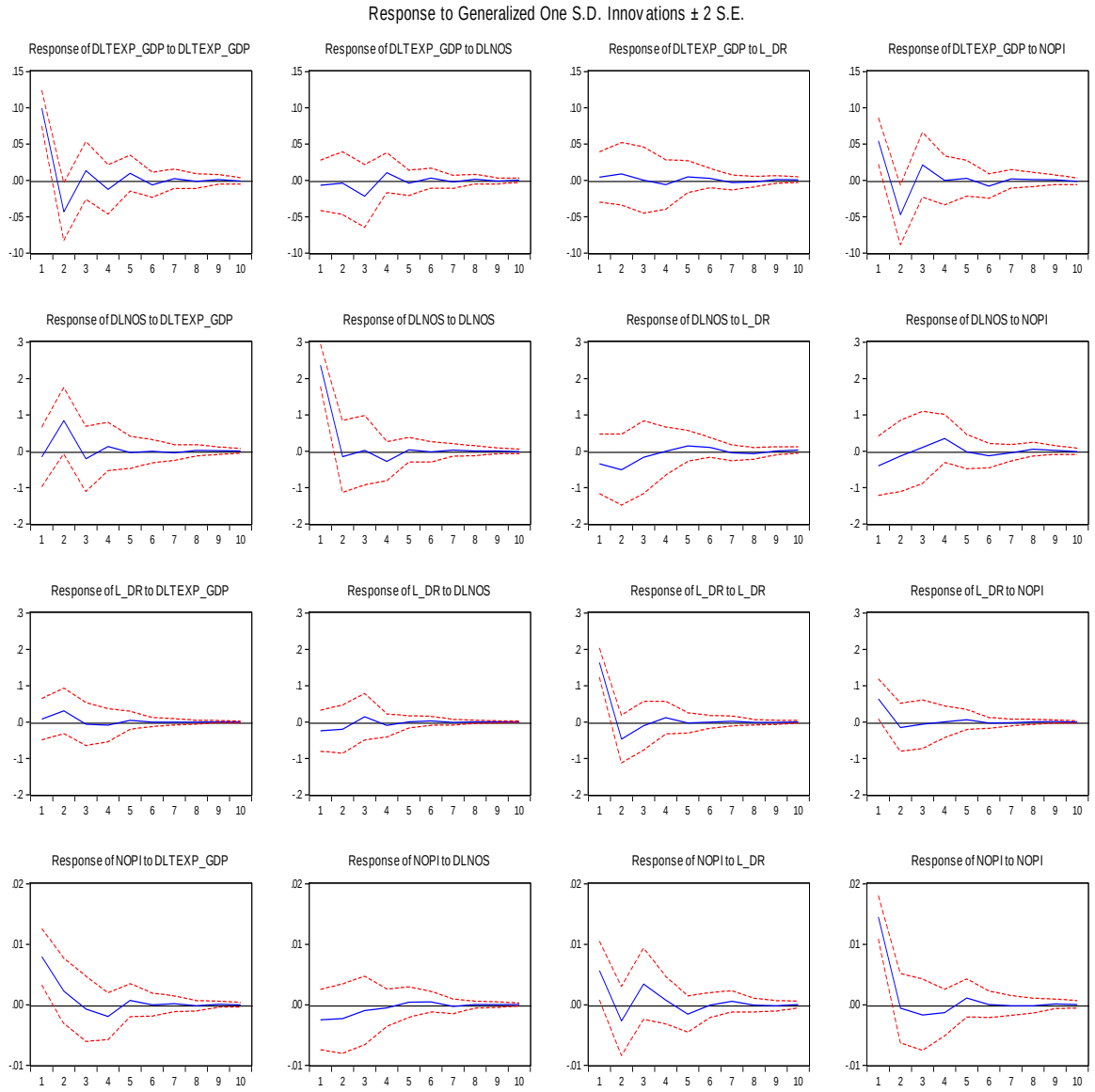

FIGURE 5.2: RESPONSE OF GOVERNMENT SPENDING TO OIL PRICE VOLATILITY NOPI SPECIFICATION: VAR (TEXP, DR, NOS, OILP)

CONCLUSION AND RECOMMENDATION

Crude oil, like many other primary commodities, is a major input in the production process of the Nigerian economy. Reviewing the historical trend, the world seems to have entered into an era of higher crude oil price volatility. Volatility in oil price may reduce aggregate output temporarily as it delays business investment by raising uncertainty or by inducing expensive sectoral resource reallocation. Another reason for this is the growing recognition that changes in the prices of oil poses a unique fiscal challenge for Nigeria which stems from the fact that oil revenue is volatile, uncertain and largely originates from abroad. The uncertainty and volatility of oil revenue complicates macroeconomic management and fiscal planning with the challenge being to avoid transmitting the oil price

volatility, which is outside the control of policy makers, into the macro economy. Furthermore, since oil revenue often represents transfers from abroad, changes in oil revenue drive movements in the overall fiscal balance that do not directly affect domestic demand. The fiscal use of these resources however, has significant consequence for the domestic economy (Erbil, 2011).

Against this background, this study attempts to address the following issues; evaluate the government expenditure response to oil price volatility; compare the impacts of oil price volatility and discount rate volatility (monetary) on government expenditure; and examine the asymmetric effect of oil price volatility on government spending.

This study adopts unrestricted VAR model with special attention to Generalized Impulse Response (GIRF) and Variance Decomposition (VD) functions to do the following analysis because unrestricted VAR is superior in terms of forecast variance to a restricted Vector Error Correction Model (VECM) at short horizon when the restriction is true and the performances of the unrestricted VAR and VECM for orthogonalized impulse response analysis over the short run are nearly identical. The VAR approach sidesteps the need for structural modeling by treating every endogenous variable in the system as a function of the lagged values of all of the endogenous variables in the system. Our basic VAR model has four variables, government spending, real oil price, discount rate and non-oil growth. The real oil price in this study is benched on five different transformational specifications. The middle line in impulse response functions (IRFs) displays the response of different government expenditures to a one standard deviation shock in oil prices. The dotted lines represent confidence bands. When the horizontal line in the IRFs falls between confidence bands, the impulse responses are not statistically significant.

The results of the Generalized Impulse Responses and Variance Decomposition were reported to achieve the stated objectives of this study. The findings indicate that real oil prices may have been the dominant source of government spending dynamics and that there is a long run relationship between real oil prices and government spending, non-oil growth, and discount rate differential. The empirical analyses are robust to different non-linear transformation of the real oil prices and inclusion of additional variables. Linear, Net Oil Price Increase (NOPI), Standardized Oil Price Increase (SOPI) and Positive oil price shock specifications were found to increase the government spending after some months. However, the asymmetric effect of positive and negative oil price volatility on the government spending was not supported by the statistical evidences. Finally, we examined the ability of real oil prices to forecast future government spending over long horizons. Variance decomposition error suggested that real oil prices had significant forecasting power for government spending over the long run horizons. Comparing the impacts of oil price volatility and discount rate shocks on the fiscal behaviour, oil price volatility has a greater influence on the fiscal behaviour of the government than discount rate shocks in Nigeria. Nevertheless, the overall findings therefore suggest important linkages between oil price and the government spending movement in Nigeria.

Contrary to other studies, this study establishes that shocks to government expenditure have symmetric effect, i.e. positive and negative oil price volatility have similar effects on spending behaviour in Nigeria. In this case, it is further suggested that effective management of oil windfall is also required to mitigate the effect of shocks to the country's fiscal stance. Nigeria should invest heavily in infrastructural development in order to create the enabling environment for a non-oil economy. In this regard, the provision of steady power and water supplies as well as good road and communication networks is very crucial. In simple terms, it is recommended that the Nigerian government should maintain capital spending in the budget at a minimum of 35% and try to maintain a sustainable Debt Management Strategy. The government is advised to intensify the implementation of Public Financial Management Reforms to improve revenues and reduce costs. It is also recommended that the government to intensify Public Procurement Reforms in projects to obtain value for money and cut costs.

Third, the prominence of the Net oil Price Increase (NOPI) and Standardized Oil Price Increase (SOPI) is apparent as two major or important specification of oil price volatility as they both generate greater effect on fiscal behaviour of the government. Hence, it is recommended that in building a framework for unprecedented changes in oil price, the government should consider the use of a GARCH based (both symmetric and asymmetric) analytical framework for it accounts for variance which is the departure from the average value of oil price. Concerning the NOPI, this may also be useful since it has a framework that considers the highest value of oil price with their corresponding changes over the period receipt is made for the supply of the crude oil which in the case of Nigeria is three months.

Finally, to increase oil output in international market, the government should sustain the fight against Insurgency, Kidnapping, Terrorisms, Oil Theft and Illegal Mining activities. They should intensify the reorientation of the populace through integrity campaigns. They should also intensify the fight against corruption by increasing Transparency, Accountability, and Compliance with law and order.

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