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The Influence of Oil Price Volatility on Selected Macroeconomic Variables in Nigeria

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Abstract

The paper analyses the influence of oil price volatility on Exchange Rate Variability, External Reserves, Government Expenditure and real Gross Domestic Product using the methodology of Vector Auto-Regressive (VAR) to carry out regression analysis, impulse response function and factor error variance decomposition for robust policy recommendations. The results of the research show that unstable oil price exerts varying degrees of deleterious effect on exchange rate variability, external reserves, Government expenditure and real gross domestic product (GDP). Based on the findings of the study, we recommend the need for the country to branch out its revenue sources. This will further shield the dangle effect of the fluctuation in prices of oil. Serious policy attention should be attached to agricultural reformation, industrial policy drives, mines and mineral development to diversify Nigeria's economy following the downward slide in the oscillations in oil prices to address the problem of excessive dependence on crude oil exportation. This will help to achieve sustainable growth and development in Nigeria.

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1.0 Introduction

The Nigerian economy experiences oil price volatility and macroeconomic volatility (Abdulkareem and Abdulhakeem, 2016). There is problem of exchange rate variability with attendant currency depreciation. The Nigerian money market is evolving and needs guided management of interest rate and credit systems to stimulate investment. There is high inflation rate coupled with unstable prices. The external reserves hitherto deplete continuously on the downward trend (Emefiele, 2016). These unfavorable trends of macroeconomic strings work against the growth of the Nigeria's economy. The appropriate supervising authorities currently undertake both monetary and fiscal policies in tackling the observed problems. But present scenario needs further attention to tackle the challenging classical case of stagflation in the economy. Therefore, it becomes necessary to undertake research on the influence of the unstable oil price on variability in exchange rate, government expenditure and external reserves and real Gross Domestic Product (RGDP). What is the impact of one variable on each other variables? What influence does the interaction of these macroeconomic variables exert on the economy? Or do they occur by mere chance?

Oil plays a dominant role in Nigerian economy given its huge contribution to the revenue of the country. For instance, CBN statistical bulletin (2011) shows that oil receipts accounted for 82.1%, 83% and about 90 per cent of the nation's foreign exchange earnings in 1974, 2008 and 2010 respectively. Similarly, the value of Nigeria's total export revenue in 2010 was US$70,579 million and the revenue of petroleum exports from the total export revenue was US$61,804 million which is 87.6% of total export revenue.

However, it is empirically established that oil price is one of the most volatile prices which has significant impact on macroeconomic behavior of many developed and developing economies (Guo & Kliesen, 2005). Further studies by Narayan and Narayan (2007), Mehrara (2008), Salisu and Fasanya (2013) found volatility clustering and confirm the existence of asymmetries in oil price volatility.

Therefore, the dependence of the Nigerian economy on oil proceeds as the major source of revenue is capable of raising suspicion about the influence of oil price volatility on selected macroeconomic variables in the country.

Oil price volatility introduces vulnerability of macroeconomic variables and exerts shocks. There is tendency of macroeconomic variables such GDP, inflation, exchange rate, interest rate etc to be unstable and weak in terms of withstanding shock. It is a situation whereby little shock in the economy subjects the macroeconomic variables to fluctuations with uncertainty (Abdulkareem and Abdulhakeem, 2016)

In view of the fact the oil price volatility and exchange rate variability impact on government revenues and reserves thereby generating shock to Nigerian economy, it becomes absolutely necessary to embark on further research on this subject matter with the scope of finding out the influence of oil price volatility on selected variables and why the nation is currently experiencing a classic case of stagflation considering the global slides in oil price and fluctuations in naira exchange rates with other currencies

The remaining part of the paper is organized as follows: Section 2 reviews relevant literatures, Section 3 outlines the methodology and model specification, Section 4 deals with the estimation, analysis and interpretation of empirical results, Section 5 covers recommendation and conclusion

2.0 Literature Review

Various literatures abound on the impact of oil price changes and macroeconomic variables both internally and externally. Hooker (1996) explored the robustness of oil price-macroeconomic relationship using granger causality test and Vector Autoregressive (VAR) system with structural stability. The result indicates a break down in the relationship and market collapse. He attributed the break down to misspecification of model rather than weaken relationship.

Mork (1989) decomposed oil price changes in real price increases and decreases for the examination of asymmetric response to oil price changes. The analysis showed asymmetric effect. Asymmetric effect implies that oil price increase has a clearly different effect from the effect of oil price decline. Mork, Olsen and Mysen (1994) confirmed the asymmetric effect for the OECD countries. Lee, Shwan and Ratti (1995) also revealed that asymmetric effect is stable in the period before and after 1985 regardless of its dependence on other variables.

Similarly, Narayan and Narayan (2007) modeled the volatility of daily oil prices using Exponential Generalized Autoregressive Conditional Heteroscedasticity (EGARCH) model. They revealed that asymmetric effects are evident, persistent, and permanent in the oil price series.

In a trend analysis of crude oil volatility, the Institute for 21st century Energy (2012) showed the evidence that stable energy prices (including crude oil) would boost GDP growth and the economy would perform better in such situation. Hence, volatile energy price poses a significance jolt to the economy.

To examine the importance of thresholds on the relationship between oil price shock and economic growth in Nigeria, Adeniyi (2011) applying Multivariate Threshold Autoregressive Model (MTAM) established that oil price shock do not significantly affect movement of macroeconomic aggregates in Nigeria. Olowe (2009) investigated weekly oil price volatility of all countries average spot price using EGARCH (1, 1) over the period January 3, 1997 to March 6, 2009. He found that the oil Price return series show high persistence of volatility, volatility clustering and asymmetric properties.

Guo and Kliesen (2005) investigated the impact of oil price volatility on macroeconomic activity in U.S. Using Granger Causality Test, they found a significant negative impact of oil price volatility on GDP growth over the period 1984 to 2004. Moreover, the study indicates asymmetric effect of oil price volatility on macroeconomic activities. Examining macroeconomic dynamics in oil exporting countries with the use of Panel VAR, Mohaghegh and Mehrara (2011) established that oil shocks are not necessarily inflationary. Further, domestic policies, instead of oil boom causes inflation and money is the main cause of macroeconomic fluctuations.

Recently, Ebrahim, Inderwidi and King (2014) embarked on theoretical investigation of macroeconomic impact of oil price volatility. The result showed that oil price volatility constitutes a fundamental barrier to economic growth due to its damaging and destabilizing effect on macroeconomy. Their study reveal that oil price volatility adversely affect aggregate consumption, investment, industrial production, unemployment and inflation in non-OECD countries.

Wilson, David, Inyiama and Beatrice (2012) examined the relationship between oil price volatility and economic development in Nigeria. Applying Ordinary Least Square and Granger Causality Test, the study shows that there is no significant relationship between oil price volatility and key macroeconomic variables (Real GDP, inflation, interest rate and exchange rate). Contrarily, the study of oil price shocks and volatility of selected macroeconomic indicators in Nigeria carried out by Taiwo, Abayomi and Damilare (2012) using Johansen Co-integration Test and Error Correction Model indicated that crude oil price, stock price and exchange rate have significant influence on the growth of the Nigerian economy. Oriakhi and Osaze (2013) examined the consequences of oil price volatility on the growth of the Nigeria economy within the period 1970 to 2010. With the use of VAR model, the study

revealed that oil price volatility has direct impact on government expenditure, real exchange rate, and real import while real GDP and inflation are indirectly influenced by the oil price volatility.

Similarly, Azeez, Kolapo, and Ajayi (2012) examined the effect of exchange rate volatility on macroeconomic performance in Nigeria from 1980 to 2010 employing OLS and co-integration techniques. The findings of the study revealed that oil revenue and exchange rate are positively related to GDP while balance of payment is negatively related to GDP. Also, oil revenue and Balance of Payment exert unfavorable or negative effect. But there is need to update knowledge considering the data range used which stopped at 2010.

Despite the identified importance of oil price on the macroeconomic activities, only few studies have incorporated oil price volatility in the modeling of its influence on macroeconomic variables in Nigeria. Also, that Nigeria is in a classic case of stagflation arising from volatility on oil price and variability in exchange rate makes this work aptly needed to address the current challenges and offer timely recipe to policy makers and researcher on the subject matter.

3.0 Methodology

The paper carries out dissertation using Vector Auto-regressive (VAR) Analysis to ascertain the interrelationships between oil price volatility and the targeted macroeconomic variables with quarterly time series data from 1981 to 2016 for policy analysis. The researcher's choice of technique is centered not only on the computational simplicity but also based on the optimal properties. Currently, modern economic investigation involves the adoption of econometric method in which appropriate statistical and econometric tests can be conducted to ensure the validity and reliability of data and result, for accurate projection and forecast of the phenomenon in question. Co integrated Test would be utilized to test for the 'long run relationship' among the variables. Johansson co-integration test would be utilized in co integration analysis and the 'normalized co-integrating coefficient' shall be ascertained to examine the nature of the long run relation between the variables estimated in the model. The VAR framework earmarked for this work is particularly interesting because it links the value added of all sectors and allows all the variables to be potentially endogenous, capturing the short and long run responses to fluctuations for policy recommendations.

3.1 Model Specification

This paper uses the VAR analysis to ascertain the influence of volatility in oil price on exchange rate variability, external reserves, real GDP and Government expenditure. The VAR technique is attractive for this section because it facilitates the analysis of the interrelationship among stationary time-series variables, treating all as endogenous. VARs have also been shown to be powerful for time-series forecasting, for the analysis of both short-run and long-run dynamics, impulse response functions and forecast error and variance decomposition to address the relative role and changing effects of various shocks on macroeconomic variables. The Augmented Dickey Fuller (ADF) test is employed to ascertain the stationarity of the variables. The VAR model specified is:

$$V_t = \beta + \sum_{i=0}^{n} A_i V_{t-1} + \varepsilon_t \qquad (3.1)$$

Where

V_t = (POIL, EXRT, RES, RGDP, GOVEXP), the vector of oil price volatility, exchange rate variability, external reserves, real GDP and Government expenditure,

β = intercepts of autonomous variable,

A_i = matrix of coefficients of all the variables in the model,

V_{t-1} = 'Vector of the lagged variables', ε_t = Vector of stochastic error terms.

3.2 Nature and Sources of Data for the Study

The nature of the study necessitated the use of secondary data. The quarterly time series data used in this work were sourced from CBN, National Bureau of Statistics (NBS), Debt Management Office (DMO), Organization of Petroleum Exporting Countries (OPEC) and World Bank. The data generated will be used for the estimation of the model, forecasts and simulations.

4.0 Estimation, Analysis and Interpretation of Results

4.1 Trend in the Analysis of Oil Price

The initial analysis conducted in this section entails the statement of summary statistics of the variables used. Oscillation in oil prices demonstrates three critical sections. Between 1980 and 2003, the price movements were rather smoother although there were brief dynamism of variation such as 1990

and around 2000. The second episode in the oil price movements began around 2004 and prices of oil have been remarkably higher since then. There was notable period of deep fluctuation during the 2008-2009 crises. The third episode in the oil price movements was between 2013 and 2016 when there were unprecedented downward slides with deep fluctuations. The oscillations in oil prices seem to be a recurrent factor in its trend over the targeted period. Hence, it is not usually the general movement in oil prices that raises questions about its relationship with other macroeconomic variables; it is rather its deep fluctuations and volatility.

The fundamental statistics of the variables in the study are pictured in Table 4.1below. Average oil price level is US dollars 38.37 per barrel with a very wide margin between the minimum price level and maximum level. The skewness value of 1.56 suggests that there existed more periods when the oil prices were lower than the mean value over the targeted period of the study (as depicted in the Chart above). Average naira EXRT to the dollar was 60.45 with a high coefficient of variation which suggests that EXRT has moved extensively over targeted period.

Table 4.1 Descriptive Statistics of Variables

Variable	Mean	Min.	Max.	Std. Dev.	C.V.	Skewness	Ex. Kurtosis
EXRT	60.46	0.55	150.91	57.52	0.95	0.262	-1.797
GOVEXP	263778	2335.72	1.24E+06	331441	1.26	1.231	0.329
RGDP	97689.1	44396	263679	53457.1	0.55	1.202	0.480
RES	13781.4	224.4	62081.9	16289.5	1.18	1.346	0.489
POIL	38.37	11.26	127.35	29.8	0.78	1.558	1.339

Source: Author's Summary Statistics Using GRETL

To further present the initial patterns of relationship between the variables, the unconditional correlation test is conducted and the results are pictured in the Table 4.2 below. A positive relationship

is shown among all variables in the study. GOVEXP and real GDP possess the highest correlation coefficient followed by reserves and government expenditure. Government expenditure and oil prices also have very strong relationship. This result indicates that government expenditure plays a pivotal dominance among all variables in the study.

Table 4.2: Pair-wise Correlation Matrix

EXRT	GOVEXP	RGDP	POIL	RES	
1	0.84	0.84	0.65	0.74	EXRT
	1	0.95	0.89	0.90	GOVEXP
		1	0.86	0.86	RGDP
			1	0.86	POIL
				1	RES

Source: Author's Work Using GRETL

4.2 Unit Root and Co-integration Tests

The result of the unit root test on these variables on first differences is pictured in table 4.3 below. From the result, it is seen that the ADF test statistic for each of the variables is greater than the '95 percent critical ADF values' (absolute values). With these results, these variables are affirmed to be stationary. Indeed, all variables are integrated of order one (i.e. I[1]).

Table 4.3: Unit Root Test for Variables in First Difference

Variable	Estimated value (a-1)	Test statistic
Dlpoil	-0.95	-6.46
Dlexrt	-0.91	-6.23
Dlgovexp	-1.01	-6.5
Dlres	-1.47	-7.06
Dlrgdp	-3.3	-22.82

Source: Author's Result from ADF Test

Having established that the variables in the analysis possess unit roots, we proceed to analyze for co-integration. The Johansen Co-integration method is used for the analysis since the work involves use of multivariate estimations. The results from the 'multivariate co-integration test' are pictured in the

Table 4.4 below. As observed from the table, the rank of 0 is significantly different from zero in both the λ-max and the trace tests. Thus, both the 'trace test' and the λ-max test statistics indicate that there exists at least 'one co-integrating vector' in the relationship vector between market oil prices and all independent variables. This means that a 'long run relationship' exists among these variables.

Table 4.4: Results of Johansen Co-integration Test

Rank	Eigen value	Trace test	p-value	L-max test	p-value
0	0.26827	78.949	[0.0068]	38.731	[0.0092]
1	0.15326	40.218	[0.2167]	20.628	[0.3097]
2	0.11798	19.590	[0.4621]	15.567	[0.2616]
3	0.029932	4.0222	[0.8954]	3.7682	[0.8751]
4	0.0020461	0.25398	[0.6143]	0.25398	[0.6143]

Source: Author's Work Using GRETL

4.3 The VAR Results

The results of the preliminary investigation of the VAR model are pictured in Table 4.5 below. In oil price equation, the coefficients of the first and third lags of GOVEXP and the first and second lags of RGDP are significant. These variables are therefore good predictors of oil price behavior over time. The equation of GOVEXP has a very good fit with 99 percent of the R squared value. The coefficients of first and third lags of the GOVEXP variables are significant, suggesting persistence in any form of disequilibrium in the variable over time. Real GDP is significant from the equation and it affirms that the economic performance level tends to affect the pattern of GOVEXP in Nigeria. In the

EXRT equation, first lag of oil prices has significant negative impact, indicating that falling oil prices will lead to deterioration of the EXRT in Nigeria. Thus, this result shows that the EXRT is the main channel through which oil price oscillations affect the Nigeria's economy. The first lag of exchange rate also has positive impact on current EXRT equation. In the 'foreign exchange reserves' equation, only its first and second lags are significant and are positive. This affirms that reserves in Nigeria only respond to their past value which is a distributed lags application. Real GDP responds to all of its own lags and the fourth and third lags of GOVEXP and EXRT respectively. Thus GOVEXP and EXRT oscillations are essential in real income levels in Nigeria.

Table 4.5: The Results of VAR Output

	Lpoil	*lgovexp*	*Lexrt*	*Lres*	*lrgdp*
Const	-2.17*	-2.17*	-3.79**	-4.81	-0.13
l_POIL_1	-0.1	-0.10	-0.27**	-0.11	0.04
l_POIL_2	-0.1	-0.10	-0.02	0.09	-0.07
l_POIL_3	0.19	0.19	0.14	0.04	0.01
l_POIL_4	-0.09	-0.09	-0.08	0	0.03
l_GOVEXP_1	0.97***	0.97***	0.13	-0.22	0
l_GOVEXP_2	0.13	0.13	0	0.45	-0.02
l_GOVEXP_3	-0.29**	-0.29**	-0.11	-0.49	0.08
l_GOVEXP_4	0.13	0.13	0.02	0.16	-0.09**
l_EXRT_1	0.02	0.02	0.92***	0.14	-0.02
l_EXRT_2	0	0.00	-0.06	0.26	0
l_EXRT_3	0.07	0.07	0.08	0.04	0.00*
l_EXRT_4	-0.06	-0.06	-0.05	-0.27	0.05
l_RES_1	0	0.00	0	0.44***	0
l_RES_2	-0.02	-0.02	0	0.28***	0
l_RES_3	0.03	0.03	0.01	0.12	0
l_RES_4	-0.01	-0.01	0	-0.16	0
l_RGDP_1	0.57***	0.57***	0.04	-0.18	0.33***
l_RGDP_2	-0.52**	-0.52**	-0.02	0.08	-0.18**
l_RGDP_3	0.2	0.20	0.08	0.29	0.15*
l_RGDP_4	0.03	0.03	0.29	0.54	0.74***
Adj. R-squared	0.99	0.99	0.96	0.88	0.99
F test of zero restrictions on all VARs	0.66[0.65]		0.36[0.87]	0.74[0.60]	23.0[0.0]
Max. Lag = 4					

Source: Author's Calculation Using GRETL

4.4 Analysis of Granger Causality Results

The analysis of the Granger-causality test carried out is as follows:

- Unidirectional Granger-causality from oil price fluctuation to economic growth. Here, fluctuation in oil price increases the prediction of GDP growth rate but not vice versa.
- Bidirectional Granger-causality from government spending to GDP growth rate and vice versa. Here, economic growth increases government spending. Also, government spending predicts the variation in economic growth.
- Bidirectional causality from the nominal exchange rate to economic growth and vice versa.
- Unidirectional Granger causality from oil price fluctuations to government spending. Fluctuation in oil price increases the prediction of government spending but not vice versa.

4.5 Impulse Response Functions

The results of the Impulse Response Functions are pictured in the form of graphs in fig. (1 - V) below. As hinted earlier, the charts are designed to picture a visual presentation of the changing effects of momentary shocks to the system. Figures 1– V display the impulse-response functions of the responses each of the other variables exhibits to a standard error shock to oil prices over the targeted period. These results X-ray the marginal direction of movements each of the variables will make in 10 quarters following a standard error shock in oil prices. The shock in oil prices is seen to reduce GOVEXP and naira EXRT within the entire 10 month period of the analysis. The shock in oil prices also deteriorates the reserves level and causes deep fluctuations in real GDP levels in Nigeria. This result affirms that oil price oscillation and its shocks exert clear deleterious effects on macroeconomic variables in Nigeria. Apparently, the over reliance on oil for most macroeconomic and fiscal operations has greatly tied the Nigeria’s economy to vagaries in its prices which are mostly exogenously determined.

Fluctuation in prices of oil also contributed to the variation in government expenditure in Nigeria and to the variation in the nominal exchange rate of the Naira. This is made empirically evident in the drift pattern of the forecast error variance of nominal exchange rate and government spending given the exogenous shocks to oil prices within the period of study.

Fig. 1: Responses to Shock in Oil Prices Impulse

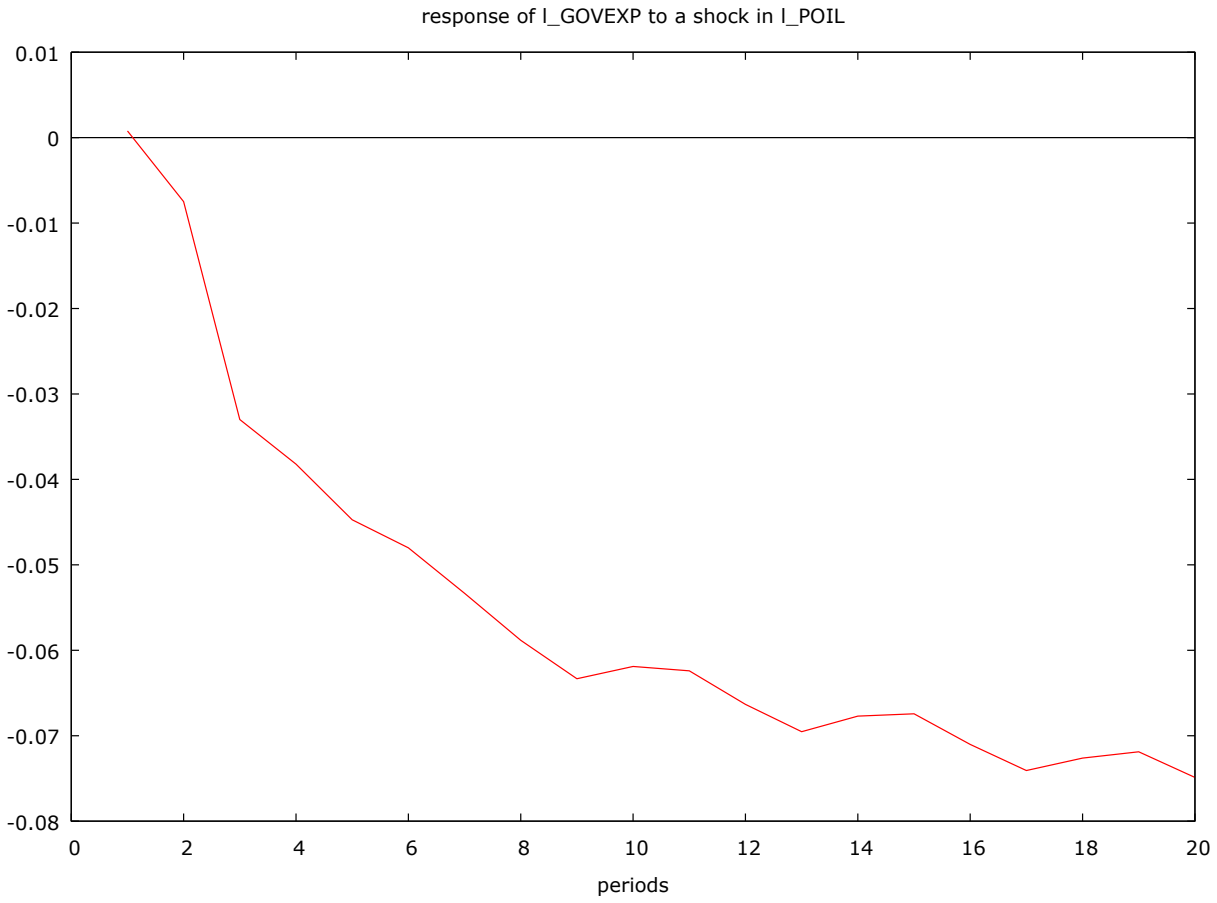


Fig. 11: Responses to Shock in Oil Prices Impulse

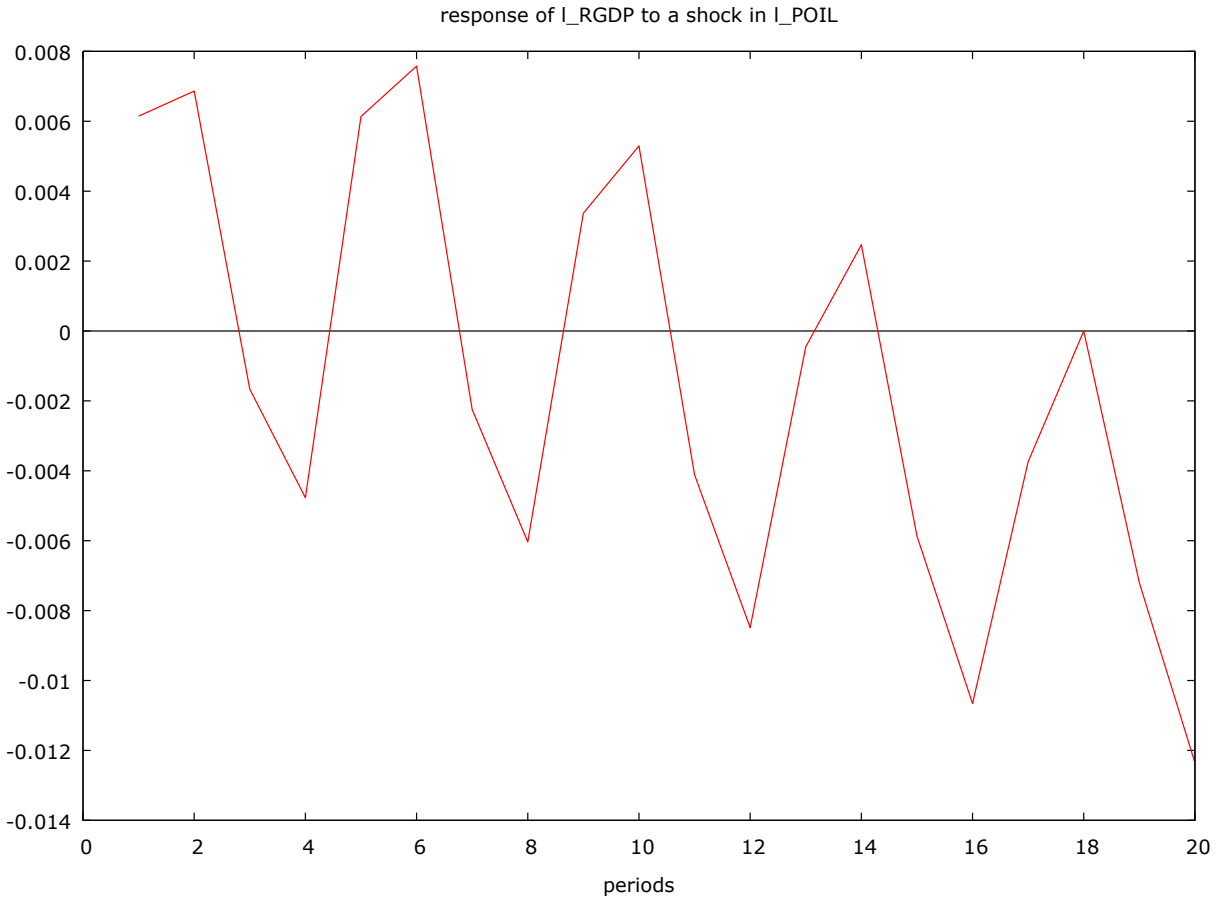


Fig. 111: Responses to Shock in Oil Prices Impulse

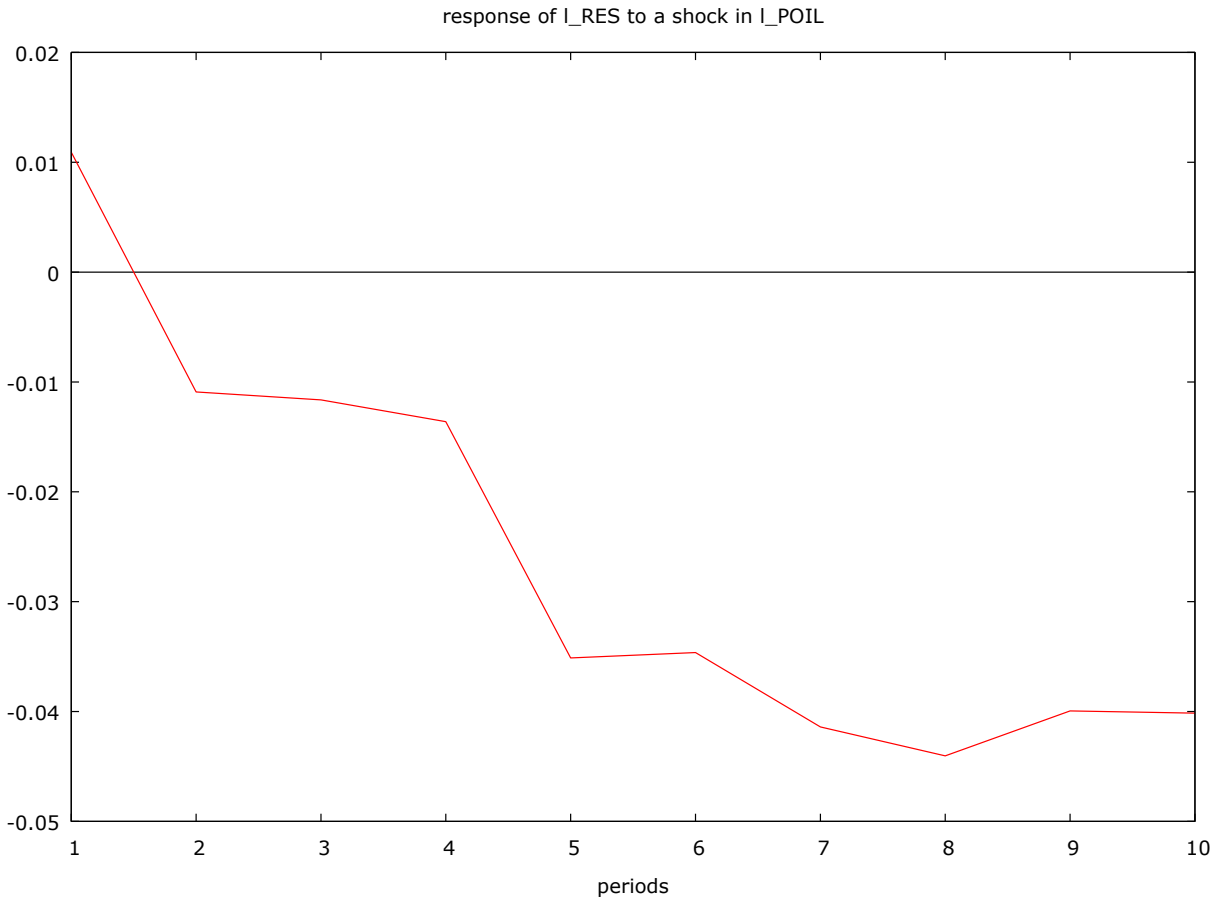
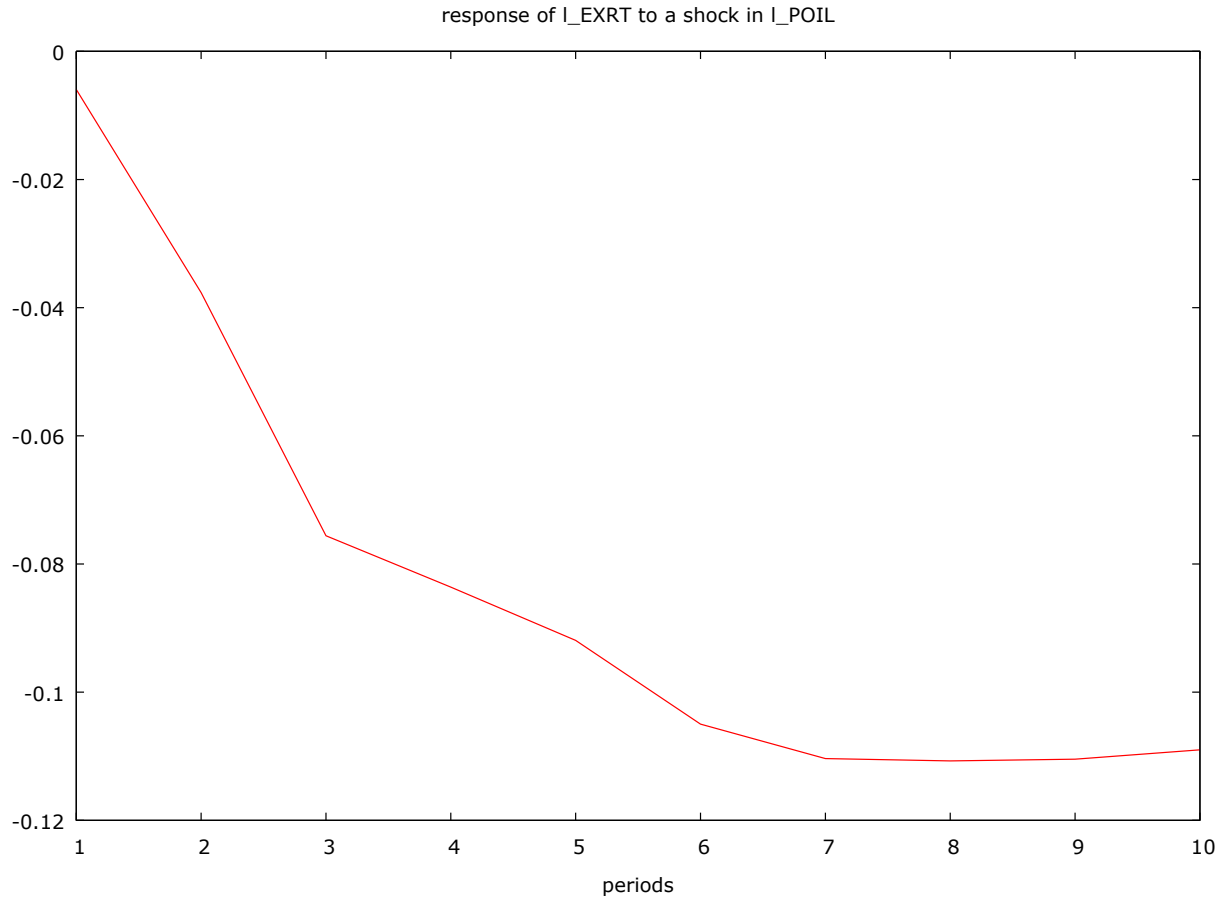
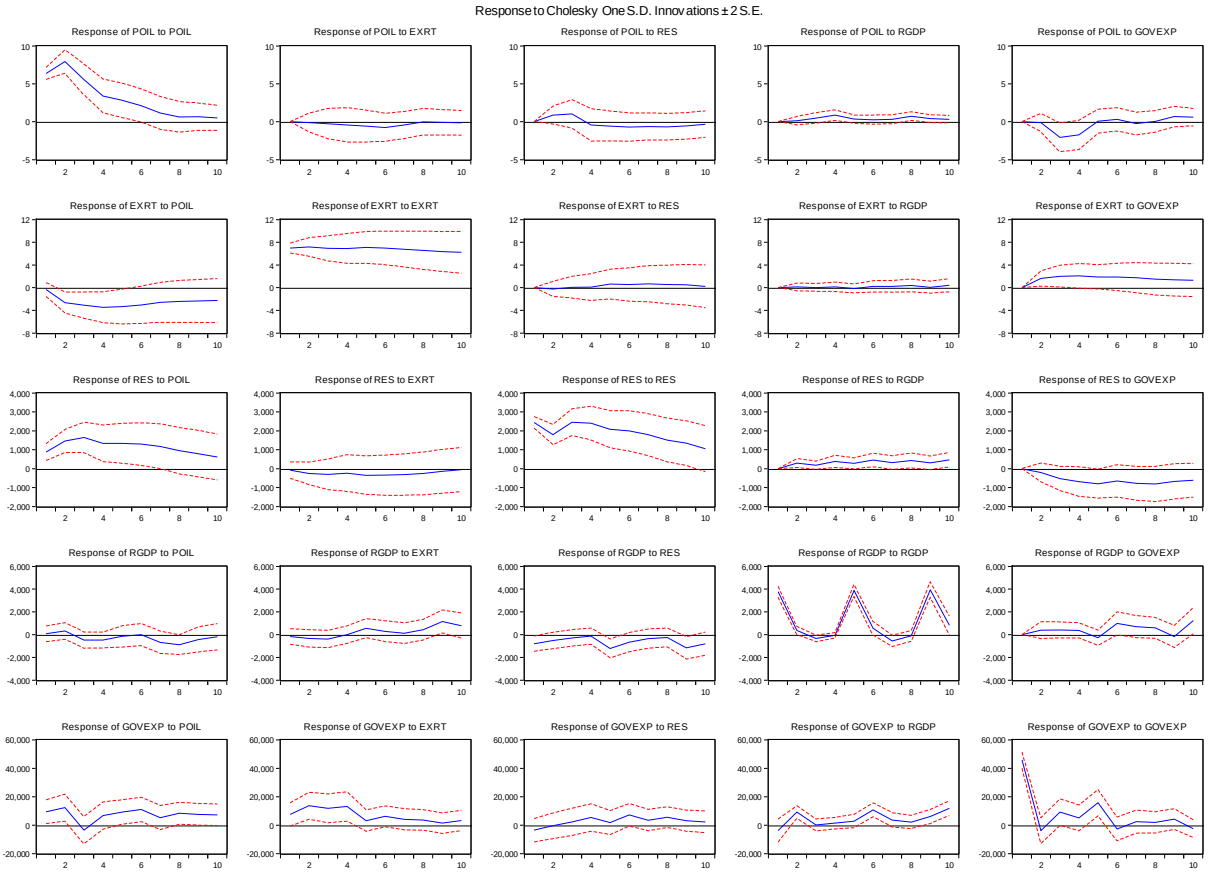


Fig. 1V: Responses to Shock in Oil Prices Impulse



Source: Author's Work Using GRETL

Figure V: Impulse Response Function



Source: Author's Work Using GRETL

The result of impulse response functions pictured x-ray a visual presentation of the changing effects of momentary shocks to the system and hence multiplier estimates in the dynamic framework. The chart shows how each of the variables responds to one standard error shock to oil price shock in the analysis

4.6 Factor Error Variance Decomposition

Finally, the forecast variance decomposition results for VAR is presented and analyzed. The 'decomposition of error variances' can provide useful information on the effects that oil price oscillations have on each of the variables. From the 'error decomposition of oil prices' pictured in Table 4.6 below, it portrays clearly that a large degree of the variances is explained by oil prices itself, suggesting that this variable is rather exogenously determined. The decomposition of GOVEXP in the Table shows that oil prices plays a strong role in its determination. The decomposition of GOVEXP shows that oil prices explain a very proportion of the variances especially from the fourth quarter. The value of the variances due to oil prices reached 20 percent in the 10^{th} quarter. Oil prices also played a very strong role in the explanation of error variances in the naira EXRT. The share due to oil prices rose from 19.2 percent in

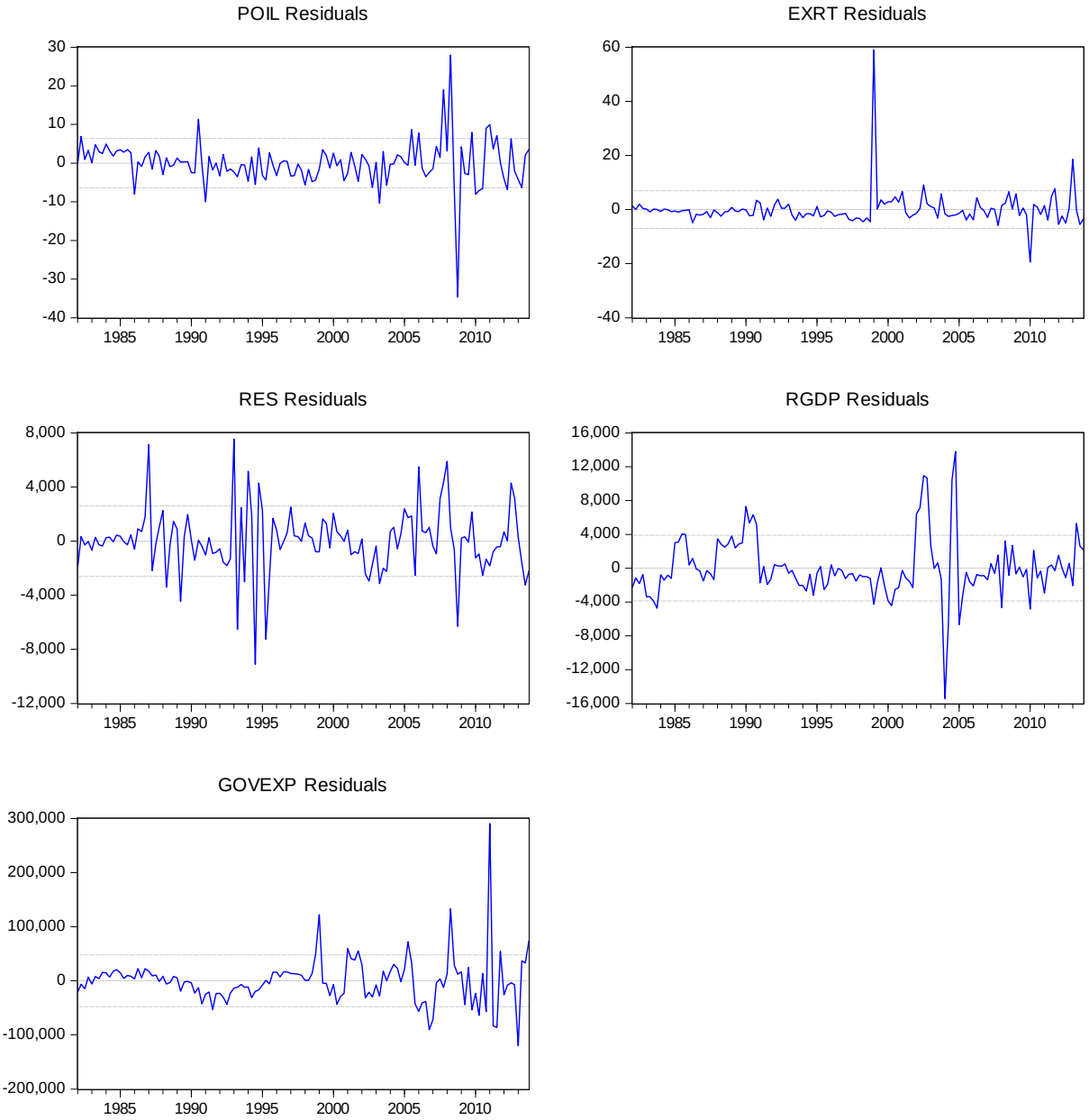
the 4th quarter to 44.3 percent in the 10th quarter. This generally shows how dependent the EXRT is on the oscillation of oil prices in Nigeria. GOVEXP also had a significant role to play in explaining the variances in EXRT. Indeed, after 10 quarters only 34.4 percent of variance in EXRT was explained by itself. Surprisingly, oil prices did not feature dominantly in the decomposition of errors in reserves and real GDP. This affirms that the variable does not have direct impact on real GDP and the level of foreign reserves. However, indirect impacts may be possible given the strong impact of oil prices on the EXRT and GOVEXP. (See figure V for details).

Table 4.6: Forecast Error Variance Decompositions of the Variables

Decomposition of variance for l_poil						
Period	*std. error*	*Lpoil*	*lgovexp*	*lexrt*	*Lres*	*lrgdp*
1	0.12	100	0	0	0	0
4	0.24	85.74	1.67	8.33	3.29	0.97
8	0.28	79.42	4.42	7.65	5.15	3.36
10	0.28	77.64	5.43	7.43	5.17	4.34
Decomposition of variance for l_govexp						
1	0.10	0.01	99.99	0	0	
4	0.20	6.25	91.84	0.06	0.22	1.62
8	0.29	15.82	81.51	0.05	0.45	2.17
10	0.32	20.02	76.75	0.10	0.74	2.39
Decomposition of variance for l_exrt						
1	0.14	0.19	4.52	95.29	0	
4	0.27	19.61	10.28	69.57	0.46	0.08
8	0.38	39.64	14.36	41.50	4.21	0.29
10	0.43	44.29	15.47	34.34	5.60	0.30
Decomposition of variance for l_res						
1	0.43	0.06	0.03	0.13	99.78	
4	0.57	0.17	0.42	3.96	95.34	0.10
8	0.61	1.79	0.48	6.25	90.92	0.56
10	0.62	2.58	0.48	6.49	89.47	0.98
Decomposition of variance for l_rgdp						
1	0.04	2.51	0.66	0.36	0.99	95.48
4	0.04	6.19	1.72	0.75	1.10	90.23
8	0.06	7.19	2.13	3.03	0.88	86.78
10	0.07	5.78	2.34	5.49	0.81	85.58

Source: Author's Calculation using GRETL

Figure VI: RESIDUALS



Source: Author's Work Using GRETL

Graphical plot of the variables are as represented above in Figure VI. As shown, fluctuations in the residuals of oil prices along with other variables are dynamic. Significantly, the residuals of real GDP, reserves and government spending show evidence of unit root as the line graph of the series exhibited huge divergence from the equilibrium line following a perturbation.

5.0 Recommendation

– * The country should branch out its revenue sources. Serious policy attention should be attached to agricultural reformation, industrial policy drives, mines and mineral development to diversify Nigeria's economy following the downward slide in the oscillations in oil prices. This will further shield the dangle effect of unprecedented shock to the economy following the shrink in oil revenue caused by fluctuations in oil prices.

– * Government should undertake export revenue drives targeted at economic expansion and development.

5.1 Concluding Remarks

The paper evaluates the influence of oil price volatility on selected major macroeconomic variables (real GDP, exchange rate reserves and Government spending).

This study finds that fluctuations in oil prices cause swings in macroeconomic variables in Nigeria. The study contributed to the large body of research that oil price fluctuation has varying consequences on macroeconomic variables in Nigeria. Based on the findings of the study, we recommend the need for the country to branch out its revenue sources. This will further shield the dangle effect of the fluctuation in prices of oil.

By implication, the Nigerian economy is vulnerable to both internal shocks and external shocks. Since the oil price volatility significantly impacts on the volatility of all the variables considered, it is a major source of macroeconomic volatility in Nigeria. Hence, fluctuations in oil price bring about instabilities in the Nigerian economy.

Oil price is considered as a relevant variable in the analysis of macroeconomic fluctuations in Nigeria. Therefore, the Nigerian economy should be diversified by revamping other sectors such as the agricultural sector and the industrial sector in order to reduce over-dependence on the oil sector to achieve sustainable growth and development in Nigeria.

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