ASYMMETRIC EFFECTS OF MONETARY POLICY SHOCKS ON OUTPUT GROWTH IN SELECTED OIL PRODUCING COUNTRIES IN AFRICA

OGUNSAKIN Sanya ✉

Department of Economics, Ekiti State University, Ado-Ekiti, Ekiti State, Nigeria

drogunsakinsanya18@gmail.com

OGUNOYE Adebayo

Department of Economics, Ekiti State University, Ado-Ekiti, Ekiti State, Nigeria

princeaogunoye@yahoo.com

Abstract

This study examined asymmetric effects of Monetary policy shocks on Output Growth of selected oil producing countries in Africa between 1980q1 and 2016q4. The study period is divided into two (Crisis period and expansion periods). Data for the study were sourced from International Monetary Fund Online Data Base, World Bank Online Data Base and Statistical Bulletin of Central Banks of various countries selected. The study employed Panel Co-integration and Panel Structural Vector Autoregressive Distributive Model as the estimation techniques. Findings from the study showed that USA Real Interest Rate, Exchange Rate and World Oil Price are major determinants of Output Growth in the selected oil producing countries in Africa. The results further revealed that shocks emanating from World Oil Price and US Real Interest rate had much negative impact on the output growth of the selected countries especially during crisis period than expansion period. The results further showed that both monetary policy and output growth were asymmetric considering the two business cycle in the study (expansion and recession periods).Based on these findings, the study therefore, recommends that governments in various selected countries should tighten their monetary policy against the unconventional monetary policy of US Federal Reserve Banks.

Keywords: Monetary Policy Shocks, Output Growth, Oil Price, Interest rate, Exchange Rate, SVAR

INTRODUCTION

Monetary policy is a deliberate effort by the monetary authority to control the money supply and credit conditions of an economy for the purpose of achieving some specified macro-economic policy objectives. Some of the most important objectives of monetary policy in the recent years especially in developing countries have been the attainment of rapid economic growth, poverty reduction and inflation targeting. Monetary policy is one of the key drivers of economic growth through its impact on macro-economic variables. Economic growth is essential in an economy as it reduces poverty as well as improving livelihoods. Economic growth is measured by increase in quantity of goods and services produced in a country. Thus, output growth occurs when productive capacity of an economy increases over a given period of time and which eventually leads to increase in per-capital income and raising the standard of living of the people and reducing inequalities of income distribution (Bhuiya, 2008)

The asymmetric effects of monetary policy on economic growth and development has been a subject of debate since the World's great depression of 1920's. However, (Friedman, 1968) was of the opinion that monetary policy is one of the macro-economic policy instruments that can be used to control or regulate inflation but very hard to use in managing economic recession. This view has been vehemently confirmed especially in advanced economics but yet to be adequately investigated in African oil producing countries.

African economic growth has been fluctuating and erratic in the past two decades. Before 1980, the growth rate of many African countries was more or less at the same rate with many other regions of the world (World Bank, 2012). However, in the year between 1983 and 2000, the growth rate collapsed especially in oil producing nations due to reduction in term of trade, increase in external shocks of oil price and increase in the real rate of interest which brought the annual GDP growth from around 4.8 percent before 1980 to 2.1 percent in the 80s, 90s and even 2000s, (World Bank, 2012). This decline in growth rate of many Africa countries necessitated introduction and implementation of some economic and financial reforms such as (SAP) Structural Adjustment Programme, Banking sectors reforms and several others. The introduction of SAP particularly made the situation worse in the mid-1980s, the policy was more or less adopted across most African countries.

In the period between 2000 and 2007, many African countries recorded reasonable economic growth largely from the significant increase in the prices of primary products. However, this was altered by the global financial crises that commenced in U.S.A and later spread to other regions including African countries which brought liquidity crunch in the banking sector as a result large of capital outflows which brought pressure on foreign exchange market and also induced large volume of non-performing loans on the banking sector and crash in the

stock prices across globe. This global financial and economic crisis metamophized to the reduction in oil price of the recent time of 2014 to date that caused external reserves of many African oil exporting countries such as Angola, Nigeria, Libya, Algeria and Egypt to decline.

Furthermore, the asymmetric effects of monetary policy on macroeconomic variables can occur from different channels. One of these channels is based on credit market imperfections. In this channels, expansionary monetary policy will permits firms to finance their activities through retained earnings and external finance premium which is likely to be relatively low because of strong balance sheets. However, during contractionary monetary policy regime, firms find it hard to finance themselves with retained earnings since cash flows are low. Higher dependence on external financing makes them more sensitive to changes in the monetary policy stance. Hence, an unanticipated change in interest rate leads to significant effects on economic activity in contractionary period. Bernanke and Gertier (1989), Bernanke and Gertier (1995) and Bernanke et al (1996) as cited by (Engiz and Mustafa, 2016). Another channel is based on the standard New-Keynessian theoretical structure which assumes a supply curve is flexible and convex while the monetary actions are neutral in the case of negative shocks and non-neutral in the case of positive shocks. Cover (1992). Credit restrict models imply that contractionary monetary policy causes banks to become cautious about giving money and thus they will try raising interest rates. Thus, a contractionary monetary policy is characterized by strong credit demand which might be more appropriate on many occasions. Morgan (1993). Also, another channel comes from the menu cost models, where higher levels of inflation encourage firms to adjust their prices of final products where lower levels do not give firms enough incentive to change the prices of their products (Mamdouh, 2018).

Additionally, one of the important aspects in the asymmetric effects of monetary policy on the macroeconomic variables is the identification of monetary policy shocks. If monetary policy is not correctly identified, then the effects of such shocks on macroeconomic variable could cause misdirection of policy action. For instance, using interest rate directly as monetary policy indicator may be inadequate since interest rates are treated as being endogenous. However, the appropriate monetary policy shocks is generated by (Kilinc and Tunc, 2014) which of cause has been the one employed mostly in emerge market economies. Monetary policy shocks occur when apex banks depart, without proper advance warning from an established pattern of interest rate increase or decrease or money supply control. It is an attempt by the central banks to specifically cause recessions and inflation and therefore excludes both monetary contractions that are generated by concerns other than inflation on all monetary activities.

In oil producing countries, it is assumed that there exist an international transmission channel of the effects of monetary policy through shocks in the global oil market. Tight monetary policy leads to a friction on the oil market with the attendant full in prices. This in turn, leads to lower export revenue earned by the oil exporting countries and weakening their national currencies. The depreciation in the national currency leads to growth of inflationary pressure in their domestic market. The reaction of oil exporting countries reduces pressure on the international currency and the treat of imported inflation.

Moreover, this sudden reduction in the price of crude oil at international oil market in the late 2014 and till date have more significant negative impact on the African macro-economic performance. This brought about an increase in commodity prices (inflation), low inflow of capital, reduction the values of domestic currencies, low investment, economic recession and decline in foreign assistance. This further brought about weaker export revenue, pressures on current account and balance of payment with negative effects on investment and employment. Furthermore, Studies have been conducted on the relationship between monetary policy and economic growth both in developed and developing nations (Parker and Rothman, 2004), (Covers, 1992), (Raddats and Rigbon, 2003), (Alam and Waheed, 2006), (Suleiman and Lawal, 2016) and several others. Beside that, majority of these studies were carried out in oil importing countries also, some of these studies were countries specific. In a nutshell, these previous studies have generated a lot of conflicting views as regards the relationship between monetary policy and output growth. Example of this can be traced to the works of (Enock and Nicolas, 2014) who submitted in their findings that monetary policy has a positive impact on economic growth, while (Akhar, 2012) was of opinions that monetary policy has negative influence on economic growth. These divergent opinions might be due to the omission of asymmetric effects in the monetary policy and output growth relationships and most of the times, economic growth reactions to monetary policy shocks vary according to the business cycle phases. This assertion was confirmed by (LO and Piger, 2005), who argued that monetary policy shocks have stronger real impacts in the period of recession than in expansion. This present study therefore, corrects this setback by avoiding the mixture of business cycle regimes; this is done by dividing the periods under this study into expansion and recession periods. Based on this backdrop, this study therefore examined the asymmetric effects of monetary policy on output growth in oil producing countries.

The study covered the period between 1980q1 and 2006q4. Eight oil producing countries were selected. The selection was based on the availability of data. The study ensured that the selected oil producing countries were arrived at on the basis of criteria such as regional representation and volume of oil per day barrel production

The remainder of the paper is structured as follows. This introductory section was followed by section two that briefly reviewed the literature, section three presented the methods and materials, section four dealt with results and its interpretation and section five concludes the paper.

REVIEW OF LITERATURE

The issue of the relationship between macroeconomic performance and the instruments of achieving this has become a perennial topic in the literature both in developed and developing nations. However, some of these studies are presented here as empirical literature to guide our modeling.

(Parker and Rothman, 2003), studied the symmetric effects of monetary policy shocks on output growth before and after World War II in the United State of America. The study employed vector Autoregressive model as estimation technique. The finding from the study showed that there was no evidence confirming asymmetry of monetary policy shocks before World War II. But after the Second World War, monetary shocks were asymmetric. Also, (Alessio, Marco and Patrizio, 2010), delved into the empirical investigation between United State of America monetary policy and commodity prices. Standard Vector Autoregressive model was employed to analyse the effects of monetary policy shocks. The results from the study showed that expansionary US monetary policy shocks shot up the broad commodity prices index and all of its components. In the same line of the study, (Caporale and Soliaman, 2009), examined the asymmetric effects of monetary policy in Europe. The study covered the period between 1981 to 1998. The study employed vector Autoregressive and VECM. The result showed that there were significant differences between EU countries in the transmission mechanism of monetary policy. To support this study, (Rokon and Roberth, 2007), studied real nominal effect of monetary policy shocks in Canada between 1980 and 2002. The study employed Recursive Vector Autoregressive model as estimation technique and found that negative policy shocks increased both nominal and real exchange rate, decreased inflationary expectations and real industrial outputs and appreciated the Canadian dollar. (Volkan and Berument, 2015), investigated the asymmetric effects of monetary policy shocks on economic performance: Empirical Evidence from Turkey. The study employed monthly data between 1990 and 2014. The study equally employed Vector Autoregressive model (VAR).The findings revealed that tight monetary policy which was captured by a positive shock to interest rate decreased the exchange rate, output and prices. The effects of the loose monetary policy which was captured by a negative shock to interest rate had positive effect on other variables. In a similar study, (Raddats and Rigbon, 2013), studied the monetary policy and sectoral shocks in

USA. The Study used VAR as estimation technique. Findings revealed that the response of each of the sectors to shocks emanating from monetary policy differs. (Alam and Waheed, 2006), investigated the monetary policy transmission mechanism in Pakistan at the sectoral level between 1973 and 2003. The study employed VAR as estimation technique. Findings showed that there was existence of sectors specific variation to the real effects of monetary policy changes. For instance, the response of some sectors such as manufacturing, construction, finance services were negative, while, agriculture, forestry and fishing, mining and quarrying, electricity, gas and water were relatively insensitive to interest rate changes. (Akhar et al, 2012), analyzed the asymmetric effects of monetary shocks on economic growth and inflation in Iran between 1973 and 2008. The study employed Vector Autoregressive Model. The result of the study confirmed that unexpected monetary policy has negative influence on economic growth.

Conclusively, truly, studies had been conducted on the relationship between monetary policy and macroeconomic performance both in developing, oil producing and oil importing countries (Enok and Nicolas, 2014), (Harold, 2009) (Akosa, 2015) and several others. However, literature is scant on the asymmetric effects of monetary policy on output growth especially in oil producing countries in Africa. Beside, most of these previous studies employed the unrestricted Vector Autoregressive model and Granger Casualty, these estimation techniques may be inappropriate because recursive VAR assumes that error are orthogonal and forces restriction on the residual covariance matrix, making the Structural estimates of impulse response function and forecast error variance decomposition highly sensitive to the ordering of the variables. (Central Bank of Nigeria). Some studies reviewed argued that monetary policy shocks have stronger real impacts in the periods of recession than in expansion. (Enock and Nicolas, 2014) and (Akhar, 2012) while some were of the opinion (Lo and Piger, 2015) that impact in the expansion period was higher than recession period.

METHODOLOGY

Theoretical Framework

This study's model is rested on the General Framework of the original Mundell-Fleming-Tobin Model (GFOMFT), which was propounded by (Flaschel, Ganggolf, Progno and Semmler, 2006). GFOMFT model is the multifactor framework of monetary and fiscal policy used to determine both global and domestic components on output in a standard open economy. This model is a revised version of Mundell-Flemming-Tobin IS-LM Framework.

Model Specification

The model for this study is both adopted and adapted that is, emanates from theory and previous studies. However, the model for this study is specified thus:

RGDPgr = f(RINTR, EXR,MS,MPR,IBR,WOP,USRINTR)   3.1

This can be restated in an explicit form:

$$GDPgr_{it} = \alpha_{it} + \alpha_2 RINTR_{it} + \alpha_3 EXR_{it} + \alpha_4 MS_{it} + \alpha_5 MPR_{it} + \alpha_6 IBR_{it} + \alpha_7 WOP_{it} + \alpha_8 USRINTR_{it} + \mu_{it}$$

3.2

Where:

GDPgr = Gross Domestic Product growth rate

RINR = Real Interest Rate

EXR = Real Effective Exchange Rate

MS = Money Supply (Broad)

MPR = Monetary Policy Rate

IBR = Interbank Rate

WOP = World Oil Price

USRINTR = US Real Interest Rate ((which captures Foreign Interest Rate))

μ = Error Term

α_1 = Intercept

$\alpha_2 - \alpha_8$ = Parameter Estimates

i = Countries

t = 1980-2016

The six variables (GDPgr, RINTR, EXR, MS, MPR and IBR) represent the domestic macroeconomic variables while (WOP and USRINTR) represent global macroeconomic variables. The inclusion of World oil price as part of the control variables in this study is borne out of the fact that crude oil price plays an important role in determining the street price of goods and commodities and consequently the inflation rate both in oil producing and oil importing countries. Obviously, inflation rate being one of the prime concerns of the monetary policy, it is therefore evident that the monetary policy decisions to a large extent will be affected by the crude oil price behaviour.

Estimating Techniques

The estimation techniques employed in this study are Panel Co-integration and Panel Structural Vector Autoregressive Model.

Sources of Data

This study employed quarterly data which were soured from World Bank Development Indicator, World Bank Data Base, World Bank Global Development Network Growth Data Base, National bureau of statistics and Central Bank of various African countries selected: IMF's International Financial Statistics and United Nation statistical bulletin (2016). The data were Real effective exchange rate, Real Gross Domestic, Interbank rate, Monetary policy, Real interest rate, Foreign interest rate and World oil price.

ANALYSIS: PANEL UNIT ROOT TESTS

IM Pesaran and Shin (IPS) Unit Root Test

Table 1: IPS UNIT ROOT TEST

Variables	T-Statistics	P-Value	Order of Integration
GDPgr	-8.8364	0.0000***	I(1)
RINTR	-8.5806	0.0000***	I(1)
EXR	-4.1824	0.0000***	I(1)
MS	-6.1743	0.0000***	I(1)
MPR	-5.7613	0.0000***	I(1)
IBR	-5.7818	0.0000***	I(1)
WOP	-7.7120	0.0000***	I(1)
USRINTR	-5.8173	0.0000***	I(1)

(***) represents statistical significance at 1%. Each model includes trend and constant term.

The results showed that all the time series variables attained their stationarity at first difference (table 1). This indicates that all the variables of interest were integrated of order one, i.e. I(1).

Error Correction Based Panel Co-Integration Test

Under this test, four basic types of tests are designed for the purpose of testing for panel Co-Integration. These tests are conducted based on both asymptotic distribution and cross-sectional dependence, that is, boost rapping. Therefore, results of the asymptotic distribution for the four tests are shown in the table 2 below.

Table 2: Westerlund Panel Co-Integration Test: Asymptotic Distribution Value

Statistical	Value	Z-Value	P-Value
Gt	-9.939	0.969	0.034
Ga	-10.692	7.412	0.002
Pt	-11.393	0.047	0.005
Pa	-12.999	5.941	0.027

Each test includes trend and constant terms. The lag and lead length were selected based on AIC and Bartlett Kernel Window. Width is set according to 4[T/100] 2/n which gives approximately 3 in this study.

The results in table 2 strongly showed a rejection of the null hypothesis of no long-run relationship between the output growth and Macroeconomic variables. This therefore implies that there was co-movement between output growth and macroeconomic variables in the selected oil producing countries in Africa. We therefore proceed to estimate the Error Correction Model using the fixed effect within regression. Fixed Effects, unlike the Ordinary Least Square, considers heterogeneity across groups and time, hence the estimates from Fixed Effect model are more efficient (Torress, 2010). The results are presented in table 3 below.

Table 3: Fixed Effects (Within) Regression Results of
output growth and Macroeconomic variables.

Long-Run Model

Variables	Coefficient	Standard Error	Probability
GDPgr			
RINTR	0.61298264	0.3934742	0.027
EXR	0.6634491	0.3112495	0.010
WOP	0.4191556	0.2291159	0.012
USRINTR	-0.73438512	0.4548279	0.051
Short-Run Model			
DRINTR	0.6533487	0.4523903	0.008
DEXR	0.5894869	0.3185789	0.069
DWOP	0.6153987	0.4559621	0.014
DUSRINTR	-0.5201148	0.5260864	0.024
CONSTANT	146.7479	259.5091	0.573
SIGMA-U	2.7775348		
SIGMA-E	6.2864915		
RHO	0.16332704		

F(4,148) = 3.26, Prob > F = 0.00652,

R-Squared: Within = 0.7478, Between = 0.5227, Overall = 0.8631

Table 3 exhibits the Error – Correction Based Panel Co-Integration regression using the Fixed Effect Model. The results were divided into two parts: The long run and short-run models. The first part showed the variables in their non-differenced forms and thus indicating long-run relationship, while the second segment exhibits the variables in their differenced forms showing the short-run relationships. From the long-run model, empirical results indicate that all the macroeconomic variables had a significant relationship with the output growth. This is quite evident as Real Interest Rate, Exchange Rate and World Oil Price had significant positive

impacts on the GDPgr while US Real Interest Rate exerted significant but negative impact on GDPgr. In the same vein, the results from the short-run model showed that all the four macroeconomic variables had significant relationships with the output growth in the selected oil producing countries in Africa. Moreover, the overall R-squared of the results indicates that 86% variation in the output growth is explained by all the macroeconomic variables. The Fixed Effect estimated model was also statistically significant when we consider the F-statistics of 3.26 at 10% level of significance and the F-probability value of 0.00652. The implication is that the macroeconomic variables may jointly had a significant effects on output growth in the selected oil producing countries in Africa during the period under review.

Short-Run Estimation

This is done by using Panel Structural Vector Autoregressive.

Panel Structural VAR Impulse Response Function

Figure 1a: Transmission Mechanism of Monetary policy on Output Growth: Expansion Period (1980-2006): (For the achievement of objective iii)
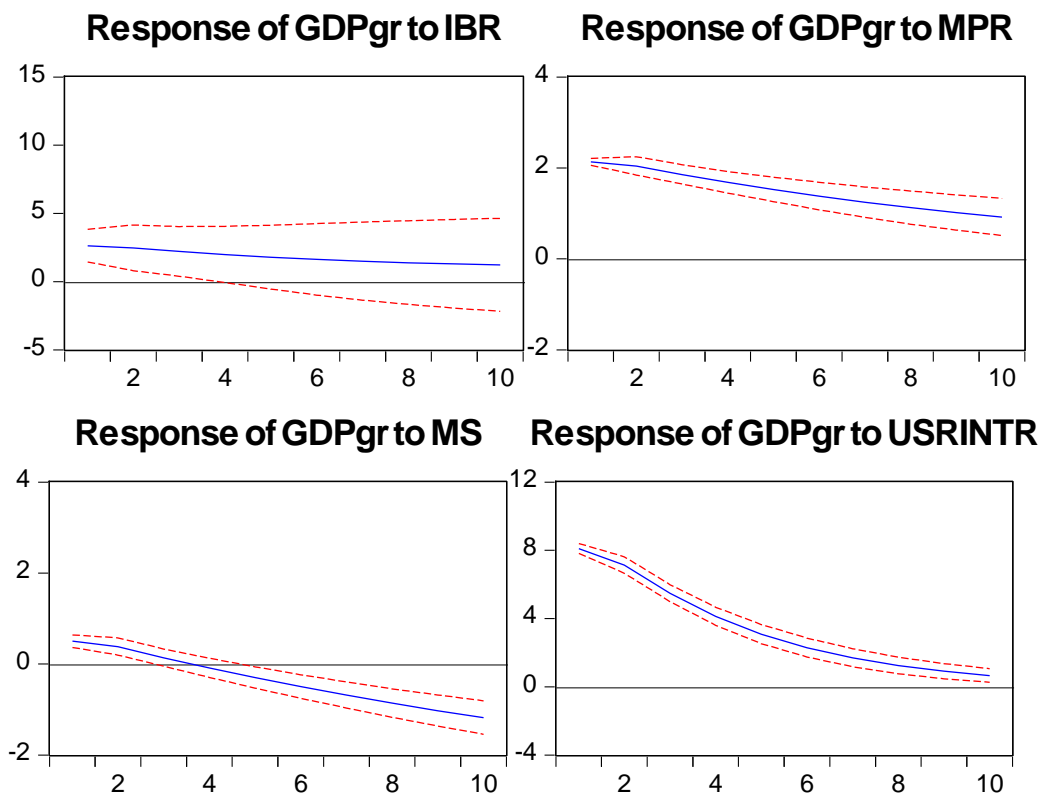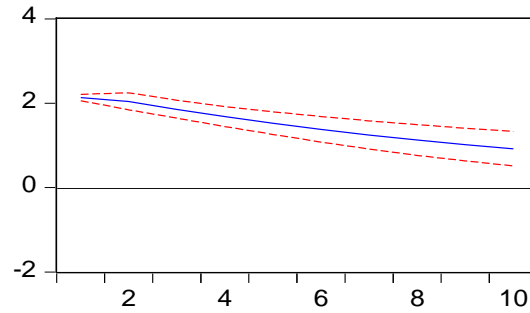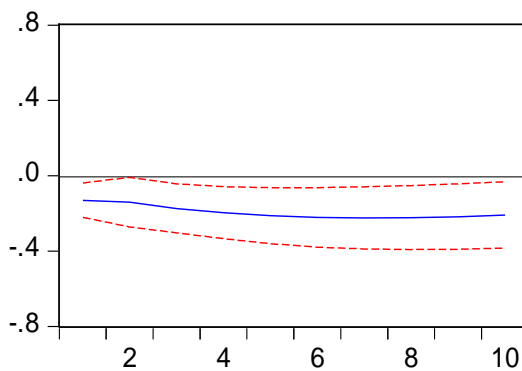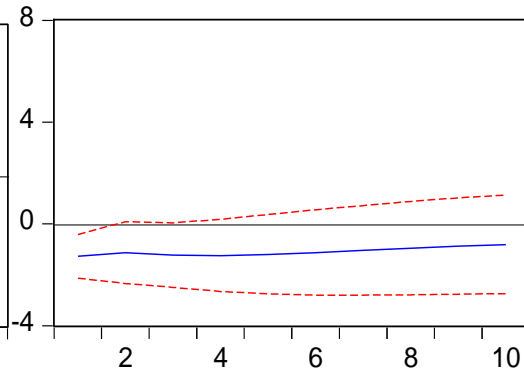
Response of GDPgr to WOP

Figure 1b: Transmission Mechanism of Monetary policy on Output Growth: Recession Period (2007-2016)
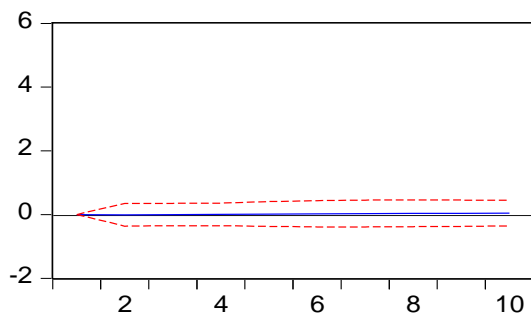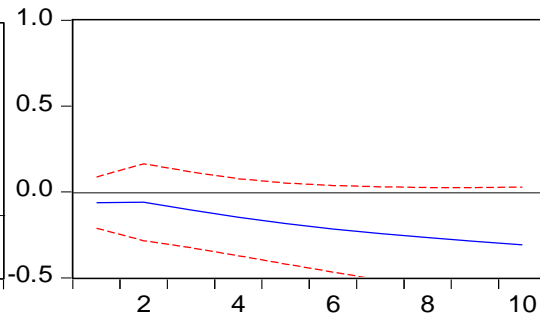
Response of GDPgr to MPR

Response of GDPgr to IBR

Response of GDPGR to MS

Response of GDPgr to USRINTR
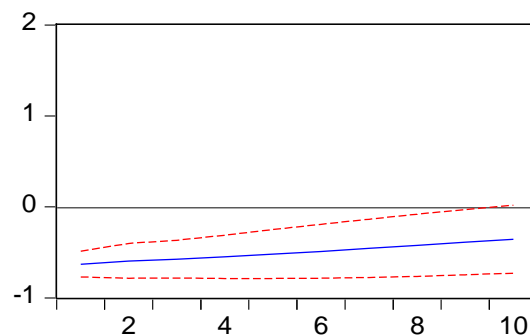
Response of GDPgr to WOP

Figure 1a and 1b displayed the Impulse Response of GDP growth rate to a standard deviation in the monetary policy variables in the selected oil producing African countries during both expansion and recession periods respectively. A standard deviation shock in Monetary Policy Rate produces positive and significant effects on GDPgr which captures output growth during the expansion period. The response of GDPgr to the shock from MPR during expansion period was largely positive from the 2nd period up to 8th period and start to diverge toward equilibrium as time increases. But it is observed that, A standard deviation shock in MPR exerted negative and significant effects on GDPgr during the crisis period.

Just like the result of response of GDPgr to MPR, a standard deviation innovation from Inter Bank Rate (IBR) produced the same positive and significant effects on GDPgr during the expansion period. The only difference is that MPR has more significant and positive impact on GDPgr than that of IBR during the expansion period. The case was different during the recession period as the standard deviation shock in IBR has negative and significant impact on the GDPgr.

The response of GDPgr to a standard deviation shock from Broad Money Supply (MS) during expansion period was positive from the 2nd period up to the 3rd period and later diverged negatively away below the equilibrium as time increases. On the contrary, the case was quite different during the crisis period as the shock from Broad Money Supply has no significant impact on the GDPgr.

A standard deviation shock from US Real Interest Rate exhibited positive and significant effects on the GDPgr during the expansion period. A critical observation from this period showed that a positive effects from US Real Interest Rate was large starting from the 2nd period up to the 5th period and later started to diverge toward equilibrium as time increases. However, the case is now different for the shock from US Real Interest Rate during the recession period, as it now exerted negative and significant impact on the GDPgr.

The response of GDPgr to a standard deviation shock from World Oil Price (WOP) exerted positive and significant effects on the GDPgr during the expansion period. Though, the positive impact was great initially but later tends towards equilibrium as time increases. The reverse is the case during the crisis period as the shock coming from World Oil Price now produced negative and significant impact on the GDPgr.

Figure 1c: Effects of Macroeconomic variables on Monetary Policy Rate: Expansion period (1980-2006): (This captured the asymmetric effects of macro-economic variables on MPR which was stated in objective iv)
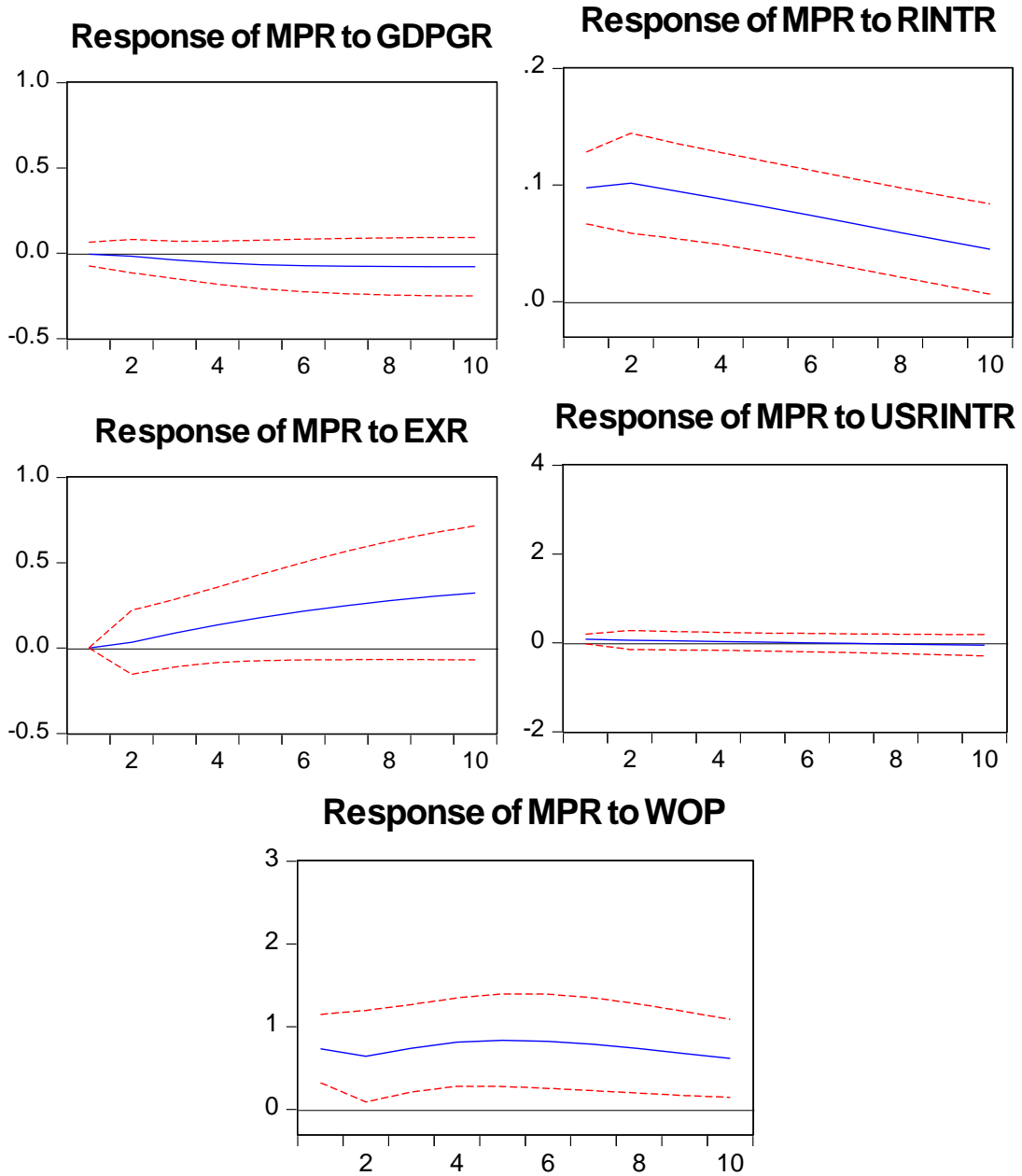

Response of MPR to GDPGR

Response of MPR to RINTR

Response of MPR to EXR

Response of MPR to USRINTR

Response of MPR to WOP

Figure 1d: Effect of Macroeconomic variables on Monetary Policy Rate: Recession period (2007-2016)

Response of MPR to GDPgr
Response of MPR to RINTR
Response of MPR to EXR
Response of MPR to USRINTR
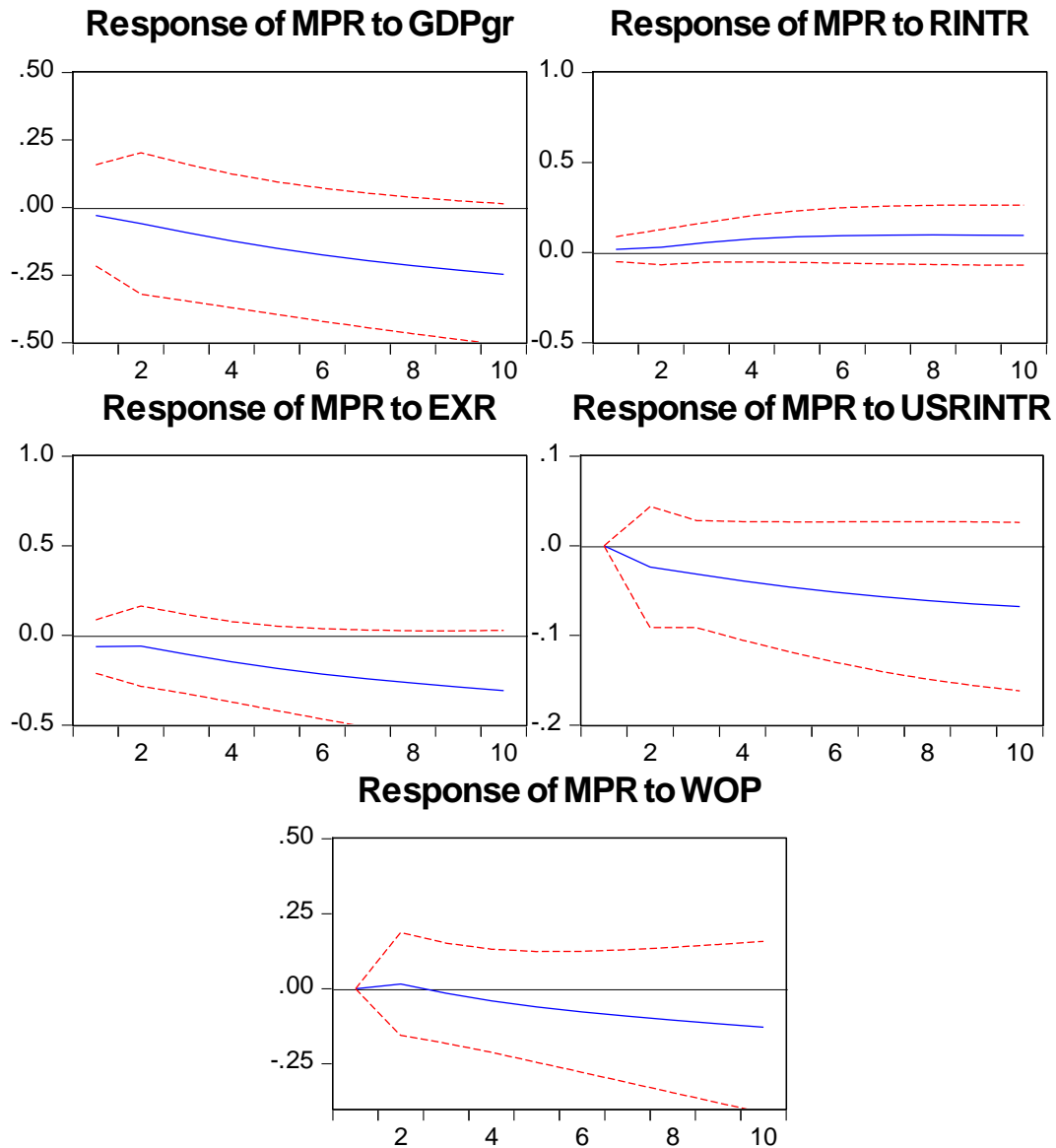### Response of MPR to WOP

Figure 1c and 1d showed the Impulse Response of Monetary Policy Rate to a standard deviation shock from the macroeconomic variables in the selected oil producing countries in Africa during both expansion and recession periods. A standard deviation shock from GDPgr produced negative and insignificant impact on Monetary Policy Rate during the expansion period. The case was equally similar during the recession period as the shock from GDPgr also exerted negative impact on the Monetary Policy Rate. But the little difference is that the negative impact of GDPgr shock was now significant during the crisis period.

The response of Monetary Policy Rate to a standard deviation innovation from Domestic Interest Rate was positive and significant during expansion period. The case was also the same during the crisis period as the standard deviation shock from Real Interest Rate also produces positive but insignificant impact on Monetary Policy Rate.

The response of Monetary Policy Rate to one standard deviation innovation from Exchange Rate (EXR) was positive and significant during the expansion period. On the contrary, the case was different during the recession period as the shock from EXR exerted negative and significant impact on the Monetary Policy Rate. The negative impact of Exchange Rate on the Monetary Policy Rate increases throughout the reviewed periods.

The shock from Foreign Interest Rate which was proxied by US Real Interest Rate has no significant impact on Monetary Policy Rate during the expansion period. But reverse was the case during the recession period as the shock from US Real Interest Rate now produced negative and significant effects on the MPR. In addition, a standard deviation shock from World Oil Price (WOP) exhibited positive and significant effect on Monetary Policy Rate during the expansion period. But the case was quite different during the recession period because the response of Monetary Policy Rate to the shock from World Oil Price is now negative and significant.

DISCUSSION OF FINDINGS

In a bid to guide against spurious regression in this study, time series properties of all the variables were tested by the use of IM Persaran and Shin (IPS) panel unit root test. Going by the results of the unit root test, all the variables were stationary after the first difference i.e. they were integrated of order one I(1) which indicates that any disturbance or shock to the variables will not be sustained for a long period of time. The results further necessitated the reason to proceed to panel co-integration test. The results of Westerlund Panel Co-integration test, confirmed that there was long – run relationship between the output growth and macroeconomic variables. The implication of these results is that there was a long term co-movements between output growth and macroeconomic variables in the selected oil producing African countries. Both the long and short – run model of the fixed effect regression results confirmed that all the macroeconomic variables had significant impact on the output growth in the selected oil producing African countries. This result is in line with the findings of Central Bank of Nigeria (2004) that submitted that there was long-run relationship between macro-economic variables and monetary policy variables.

Also, the P-SVAR impulse response function results in this study confirmed that standard deviation shocks from the two prominent monetary policy variables (MPR and IRR)

have positive and significant impacts on output growth (GDPgr) during the boom period. These positive and significant relationships found during the boom period implies a healthy and an aggressive monetary policy put in place by the selected oil producing African countries, thereby exerting positive effects on their GDP growth rate. However, the negative and significant relationships between the two monetary policy variables (MPR and IBR) and output growth, that was recorded during recession period was a symptom of a thwarted monetary policy caused by a depressed economic situation thereby having negative impacts on Gross Domestic Product growth rate of the selected producing African countries. This result negates the finding of (Volkan & Berument, 2015) which says monetary policy had negative impact on output growth.

A very important finding in this study was the results from P-SVAR impulse Response Function which revealed that a standard deviation shock from US Real Interest Rate exerted a negative and significant impact on output growth during recession period for the selected oil producing African countries. In clear term, this finding implies that there was a high sensitivity of the oil producing countries in Africa to the U.S monetary policy shock during the recession period. This finding might be linked to the unconventional monetary policy put in place by the U.S. Federal Reserve Bank to reduce the distress of global financial crisis in 2007. This policy which was targeted at purchasing a large amount of government securities and other private sector assets in order to lower long term interest rate crowded out private investment. This made the private investor to shift their investment base and move to alternative emerging economies particularly in the selected oil producing African countries. This therefore resulted to the capital inflows along side the 2007 recession elements from U.S. into African economy (Joyce, 2012). A strong negative impact of this U.S. monetary policy on African output growth was due largely to the weak monetary policy in the oil producing African countries during this crisis period which was supposed to act as a shield against the risky U.S. policy.

Furthermore, the results of P-SVAR Impulse Response Function in this study also revealed that the response of output growth to the World Oil Price (WOP) was negative and highly significant during the crisis period in the selected oil producing African countries. This finding might be connected with a fall in the global oil price due to the global financial crisis in 2007. This result corroborates the assertion of (Bjornland, 2009) that an oil price fall is expected to have negative effect on the output growth of an oil producing country.

Another finding notable of discussion in this study was the response of Monetary Policy Rate (MPR) to the output growth (GDPgr) which was negative and insignificant during the expansion period in the selected oil producing African countries. This is an indication that only the Monetary policy transmission mechanism played a crucial role in the output growth of the oil producing countries in Africa whereas, the output growth is not linked to an effective monetary

policy in the selected Oil Producing Countries in Africa. This result is in line with the findings of (Sulaiman & Migiro 2014).

SUMMARY AND CONCLUSION

This study examined the asymmetric effects of monetary policy shocks on the Output growth of selected oil producing countries in Africa, using quarterly data spanning between the period $1980q_1$ and $2016q_4$. The paper made used of Panel Co-Integration, and Panel Structural VAR as estimation techniques. Findings from the study showed that there was long-run Co-movement between output growth and macroeconomic variables in the selected oil producing countries in Africa.

Both the long and short – run models of the fixed effect regression results confirmed that all the macroeconomic variables had significant impact on the output growth in the selected oil producing African countries. Also, the P-SVAR impulse response function results in this study (MPR and IRR) have positive and significant impacts on output growth (GDPgr) during the boom period. These positive and significant relationships found during the boom period while, (MPR and IRR) showed negative and significant impacts on output growth (GDPgr) during recession period. It is pertinent to indicate that Impulse Response Function which revealed that a standard deviation shock from US Real Interest Rate exerted a negative and significant impact on output growth during recession period for the selected oil producing African countries. The implication of this result is that there is high sensitivity of the oil producing countries in Africa to US monetary policy shock during recession period. This might be as a result of unconventional monetary policy put in place by the US.

The study therefore, concludes that both monetary policy and output growth are asymmetric conserving the two business cycle in the study (expansionary and recession). Based on this finding, the study therefore, recommends that government in the various selected countries should tighten their monetary policy against the in conventional monetary policy of USA federal reserve bank.

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