

Fiscal Dominance and Monetary Policy Effectiveness in Sub-Saharan Africa

Ogunsakin Sanya (Ph. D)

*Ekiti State University, Ado-Ekiti
Department of Economics
Faculty of the Social Sciences
Olaoye Florence*

Abstract

This study examined presence of fiscal dominance and effectiveness of monetary policy in Sub-Saharan Africa countries between 1995 to 2018. Thirty three Countries were selected for the study. Data for the study were sourced from world Bank online database, IMF online database and Central Banks of the selected countries. The study employed panel vector Error Correction as estimation technique. Results obtained from our various empirical estimations showed negative and insignificant response of monetary policy variables to fiscal policy variables. Based on this finding, the study therefore concludes that there is absence of fiscal policy dominance in the conduct of monetary policy in the selected Sub-Saharan Africa countries during the study period. The study recommends that for the attainment of macroeconomic policy stability, both monetary and fiscal policy are required to be used simultaneously.

Keywords; *fiscal dominance, monetary policy VECM and Sub-Saharan Africa.*

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I. Introduction

The attainment of macroeconomic policy objectives are essentially required in every nation (developed or developing). Fundamentally, these objectives include, price stability, balance of payment equilibrium, steady economic growth, exchange rate stability and full employment. These sets of objectives are primary and required by every nation irrespective of their level of development. However, some objectives are equally important and at the same time complement primary objectives especially in developing countries. These are elimination of economic of dualism, environmental protection, equitable distribution of resources and debt management. Iyoha (1999). These sets of objective are known as secondary or surrogate objectives. To achieve these objectives (primary and secondary) some instruments are usually mobilized. Some of these instruments are active while some of them are passive. The active ones are monetary and fiscal policies while passive ones especially in developing countries are income policy, trade or commercial policy, debt management and exchange rate policy.

In pursue macro-economic management, these active instruments are mostly employed together to put in place both internal and external balance. Take for instance, in the Keynesian range. Fiscal policy is active in increasing the equilibrium level of income while monetary policy is passive. In the classical range, monetary policy is effective in increasing equilibrium level of real income while the fiscal policy is dormant. In the intermediate range, both fiscal and monetary policy are moderately active in increasing the equilibrium level of income. Since it is not always possible to ascertain a priori in what range the economy finds itself at any given time, it seems reasonable to use the combinations of both fiscal and monetary policy to control the level of economy. In using these two instrument simultaneously, there is possibility of either to override another which may call for a threat to smooth, and efficient macroeconomic management. If this occurs, it refers to either fiscal or monetary dominance. Fiscal dominance is seen as a situation in which fiscal authority used a fiscal posture that contradicts price stability objective. It equally implies a situation in which the duty to satisfy the government inter temporal budget constraints centers on monetary policy instead of fiscal policy. In most developing countries where there is a poorly coordinated macroeconomic policies, either of the policies might treat the effectiveness of other. However, monetary policy dominance implied a situation in which fiscal policy is dominated by monetary policy.

Fiscal deficit has become one of the features of developing countries. This has however led to borrowing both internally and externally which brings about increasing in public debt to GDP ratio. This has increased the concerns for the presence of fiscal dominance.

Studies have been conducted on the relationship between fiscal and monetary policies. See Afolabi and Atolagbe (2018) Sanusi and Akinlo, (2016), Folorunso and Ajisafe (2000) and others. While some of these studies were on effectiveness of fiscal and monetary policies as tools of economic stabilization, some were on either fiscal dominance or monetary dominance. Besides all these studies mentioned were on country specific. It is pertinent to use panel data to investigate the existence of either fiscal dominance or monetary dominance in Sub-Saharan Africa countries.

The rest of the paper is structured thus, this introductory section is followed by section two that presents literature. Section three deals with methods and materials. Section four centres on results and discussions. Section five concludes the paper.

II. Empirical Review

Joines,(1986), examined the fiscal dominance in United States of Americas using trends analysis. Results from this study showed evidence of fiscal dominance in USA during the study period. Gallo & Otranto, (1998) examined the fiscal dominance in Italy between 1863 and 1994. Finding from this study also confirmed the evidence of fiscal dominance in Italy during the study period. Aiyayari&Gertler,(1985) studied the proportion of government debt that is backed by fiscal policy. Findings from this study revealed that the proportion of government debt as a component of fiscal policy is a measure of the extent to which monetary policy accommodates fiscal policy. Therefore, the fiscal requires can be indexed by the estimated value of this proportion. In Italy Frattian & Spinelli,(2001) studied the relationship between fiscal dominance and money growth. The study employed co-integration and error correction as estimation technique. Result from the study showed evidence of fiscal dominance in Italy since political unification in 1861. Favero & Monucell,(2003) studied the monetary dominance in United States between 1960 and 2000. The study revealed the existence of monetary policy dominance between 1960 and 1987 but between 1987 and 2000 both fiscal and monetary policies were relatively effective. Bown,(1998) also investigated the relationship between fiscal and monetary policy in United States using vector Autoregressive as estimation technique. Finding from this study showed evidence of monetary dominance.

Tugba,(2007) examined the relationship between fiscal dominance and inflation targeting in Turkey between 1980 and 2005. Finding from this study showed that real effective exchange rate was determined in Turkey by foreign interest rates and the emerging markets Bond index (EMBI) but not by the domestic interest rate in the long run. Also in Turkey similar study was carried out by Tekin, Korux&Ozman (2003), that examined the interrelationship among Budget Deficits, money growth and inflation. The study made use of trivariate system containing money Growth, Budget Deficits and Inflation. Findings from the study confirmed the quantity theory of money that any change in the quantity of money will change prices as well. Afonso (2005) and Bihan(2006) studied the existence of fiscal dominance in France, Germany, Italy and the UK between 1990 and 2004. Finding from this study confirmed the existences of monetary policy dominance instead of fiscal dominance. In addition, Meltiz,(1997) investigated the relationship between fiscal policy and contractionary monetary policy in fifteen European Union countries and some OECD countries for the period between 1960 and 1995. Contrary to the previous results, this study confirmed the evidence of monetary policy dominance in those selected countries. Tanner & Ramos,(2002) examined the relationship between fiscal dominance and monetary dominance in Brazil between 1951 and 1995. Finding from study showed that a monetary dominance regime gives a more plausible explanation of the impulse responses of liabilities than fiscal dominance regime. Mehdi & Reza, (2011) also examined the relationship between fiscal deficit and inflation in Iran between 1980 and 2009. Finding from this study showed that fiscal deficit leads to inflation in Iran during the study period. Also John (2013) examined the nexus between Budget Deficit – inflation in South Africa between 1980 and 2012. The study employed vector Autoregressive distributive model as estimation technique. The study showed both long and short run relationship between budget – deficit and Inflation. The Causality runs from budget to inflation. Both the impulse response function and Variance decomposition results showed that budget Deficit was inflationary in South Africa between 1990 and 2010. The results from the study further showed that the effect was mostly responsible for by low degree of Central Bank independence and financial market development.

Cyril (2004) studied the impact of Inflation on Growth performance in Namibia. The study employed ordinary least square as estimation technique. Findings revealed that inflation was counterproductive especially, if not controlled. Solomon, (2004) investigates the effect of a Budget Deficit on inflation in Tanzania. The study employs Co-integration and Error Correction as estimation technique. Results show that the causal link runs from the Budget Deficit to the inflation rate. Furthermore, Solomon, (2004) investigates the effect of a budget deficit on inflation in Tanzania. The study employs Co-integration and Error Correction as estimation technique. Results showed that the causal link runs from the Budget Deficit to the inflation rate.

Abdulazeez (2016) examines the impact of monetary policy on economic growth in Nigeria. The study uses time-series data covering the period between 1990 to 2010. In concluding the analysis, multiple regressions

were employed to analyze data on variables such as money supply, interest rate, financial deepening and gross domestic product. They were all found to have marginal impact on the economic growth in Nigeria. The study showed further, the aims and objectives of monetary policy, which includes price stability, maintenance of balance of payment equilibrium, full employment and economic growth. Also Folorunsho & Ajisafe (2000) studied the relationship between fiscal and monetary policy in Nigeria between 1970 and 1998. The study employed co – integration and error correction as estimate technique findings from the study showed evidence of fiscal dominance. Akinlo & Sanusi, (2016) studied fiscal dominance and monetary policy in Nigeria between 1986 and 2013. The study employed co – integration and vector autoregressive as estimation techniques. Finding from this study showed no evidence of fiscal dominance in Nigeria during the study period. In the same line of study, Onwioduoki (1999) investigated the causal relationship between inflation and fiscal deficit in Nigeria between 1970 and 1994. The study made use of granger causality as estimation techniques. Result from the study showed that fiscal deficit generates inflation in Nigeria during the study period. In the same line of study, Oguninuyiwu, (2008) examined the relationship between budget deficit and inflation in Nigeria between 1970 and 2006. The study employed Granger causality as estimation technique. Finding from the study revealed that the causality runs between inflation and budget deficit was bi-directional. Omoke & Orutus, (2010) investigated the relationship among budget deficit, money supply and inflation in Nigeria between 1970 and 2008. The study made use of VECM as estimation technique. Finding from the study showed that there was long run causality between money supply and budget deficit in Nigeria during the study period. Bakara, Adesanya and Bolarinwa (2014) examined the long term relationship among budget deficit, money supply and inflation in Nigeria between 1975 and 2012. The study employed co – integration and error correction as estimation technique. Result from this study confirmed that there was long run relationship among budget deficit, money supply and inflation in Nigeria. Also, budget deficit leads to inflation during the study period. Joseph & Oluwafemi (2018) empirically analyzed the fiscal dominance and the conduct of monetary policy in Nigeria between 1986 and 2016. The study employed vector error correction as estimation technique. Finding from the study revealed that budget deficit, domestic debt and money supply had no significant impact on the average general price level. However, budget deficit and domestic debt are shown to have significant impact on money supply only in the short-run. The implication on this result is that there is relative evidence of fiscal dominance in Nigeria during the study period.

In summary, from the studies revealed empirically above, studies on fiscal dominance and monetary policy are very few in panel studies. Even findings from existing studies produced a conflict results. Therefore, it is imperative to reinvestigate the existence of either fiscal or monetary dominance in sub-Saharan Africa countries making use of panel data makes.

III. Theoretical underpinning

The model for this study takes its root from general framework of the Mundell-Fleming –Tobin model which was later developed and integrated by Asbjør Røed Støer (2002). This model is considered to be multifactor framework of interaction between fiscal and monetary policy in a standard open economy and their mechanisms. In this model, both money market (LM) and commodity market (IS) are integrated.

Analysis of General Framework of the Original Mundell-Fleming-Tobin model

The equations of the original Mundell-Fleming-Tobin IS – LM framework is stated thus:

$$Y = C(Y_p, W_p, \rho, \rho^*) + I(\rho, \rho^*) + G + x(R, Y, Y^*) \dots \text{eq. 3.1}$$

$$Y_p = Y - \rho \frac{EF^*}{P} - T \dots \text{eq. 3.2}$$

$$W_p = \frac{M_0 + B_0 EF_p \rho}{P} \dots \text{eq. 3.3}$$

$$\rho = I - P_e \dots \text{eq. 3.4}$$

$$R = \frac{EP_s}{P} \dots \text{eq. 3.5}$$

$$r = I - i^* - e_e I \dots \text{eq. 3.6}$$

$$\frac{M}{P} = m(I, Y) \dots \text{Eq. 3.7}$$

$$\frac{B}{P} = W_p - F(r, W_p) - m(I, Y) \dots \text{eq. 3.8}$$

$$\frac{EFP}{P} - F(r, W_p) \dots \text{eq. 3.9}$$

$$F_g + F_p + F^* = 0 \dots \text{eq. 3.10}$$

The equation 3.1 in this framework is the traditional Tobin's National income equation where left hand side of it, is the total output and the right hand side of it, is the aggregate demand of private consumption C, private investment I, Government consumption and expenditure G and the net export X (export-import, which is the function of Risk Premium R, National income Y and return from foreign investment Y*. consumption function

C is defined as C (y_p, w_p, ρ, ρ*) where consumption C is positively related with Y_p and W_p but negatively related with ρ and ρ*.

The Y_p in equation 3.2 is the earnings (disposable income) from wage (national income) after tax, which comes from $Y - P^* \frac{EF^*}{P} - T$ where T is tax rate and $\rho^* \frac{EF^*}{P}$ is loan re-payment. Also, the W_p in equation 3.3 is the wealth income which comes from $\frac{M_o + B_o EF_{PO}}{P}$. The components of numerators consist of three types of asset demands (where M_o is the nominal total private money supply, B_o is the bond market money supply from private sector and EF_o is the foreign investment of domestic asset market) which is discounted by the price (denominator). P is the domestic interest rate which is defined by i-p_e in the equation 3.4.

ρ* is the foreign market interest rate. Investment T is the function of two types of interest rates which are ρ and ρ*. Government expenditure G is exogenously defined in this framework. R is the risk premium which is defined by $\frac{EP^*}{P}$ in the equation 3.5 where P = Domestic price level and P* = foreign price level.

Equation 3.5 – 3.10 describe the Tobin’s portfolio model where equation 3.6 is the regressive expectations which is the domestic investment expectations (i) minus external investment expectations (i*), minus expected depreciation (e_eI). Equation 3.7 describes the LM Liquidity preference – money supply curve) equation. Asset demand equation of the private sector, where $\frac{M}{P}$ is the real money demand (M₂) which is the function of domestic interest rate (i) and the national income (Y). equation 3.8 presents the bond market investment conditions (i.e. total earnings from the bond market investment) which is the final account from W_p after subtracting loan re-payment F (r, W_p) and re-investment amount m(I,y) from it. Equation 3.9 shows the loan repayment account of an investor. Finally, equation 3.10 represents the equilibrium condition for the foreign currency market where F_g = domestic government assets, F_p = domestic private assets and F* = foreign assets.

MODEL SPECIFICATION

Reference to theoretical underpinning presented in equations 3.1 to 3.10 and in view of some issues raised under empirical literature equation 3.11 is presented

$$GBD_{CE} = \alpha_1 E + \alpha_2 MBS_{CE} + \alpha_3 DIR_{IT} + \alpha_4 IR_{CE} + \alpha_5 MS_{CE} + \alpha_6 IFN_{CE} + \alpha E_{IT} \dots\dots eq 3.11$$

Where

GBD = Government Budget Deficit

MS = Money Supply

DD = Domestic Debt

DIR = Domestic real interest rate

IRF = Inflation Rate

$\mu = Error Term$

The equation 3.11 is to be estimated by panel vector Autoregressive model to examine if there is presence of fiscal dominance in the conduct of monetary policy in sub-Saharan African countries.

IV. Descriptive Statistics

Table 4.1

| Variables | Mean | Standard Deviation | Skewness | Kurtosis | Jargue berg | Probability |
|-----------|------------|--------------------|-----------|-----------|-------------|-------------|
| BP | 3.384231 | 4.033245 | 3.7456221 | 5.56661 | 65.6331441 | 0.00000 |
| MS | 3.7534112 | 7.456231 | 3.0034562 | 6.034562 | 73.4562311 | 0.00000 |
| DOM | 21.624561 | 6.462411 | 4.567892 | 2.578243 | 5.2456221 | 0.0001456 |
| DIR | 18.3343115 | 7.462214 | 14.744623 | 2.4562783 | 3.4562214 | 0.000006 |
| IFR | 9.1734562 | 10.6245611 | 12.462578 | 3.4833733 | 4.3645722 | 0.00000 |

Source: Author’s computation

On table 4.1, the descriptive statistics of variable of interest is presented. Results from the table showed, highest mean value of (21.6245621) for domestic debt (DOM) while money supply base has the lowest mean value of (3.7554112). The value of standard deviation is low across the variables. The implication of this result is that the variables of interest showed very low variability across the selected countries in Sub-Saharan Africa. Results further showed that variables of interest except domestic interest rates were positively skewed. The estimated kurtosis of the variables of interest were greater than 3 which indicate that the distribution of these variables was thicker and therefore implies the presence of heterogeneity issues in the data. The Jargue – bera values for all the variables of interest passed the significance test at the 1% level indicating that their series were not normally distributed.

Table 4.2
Panel Unit Root Test

| Variables | Statistics | Ips unit root test | Order of integration |
|-----------|------------|-----------------------|----------------------|
| BP | -5.6224 | 0.0000 ^{xxx} | 1(1) |
| GMB | -5.2321 | 0.0000 ^{xxx} | 1(1) |
| MS | -6.4136 | 0.0000 ^{xxx} | 1(1) |
| DIR | -5.2345 | 0.0000 ^{xxx} | 1(1) |
| IFR | -4.3211 | 0.0001 | 1(1) |

CROSS – SECTIONAL DEPENDENCE TEST

(x x x) and (x x) represent statistical Significance at 10% and 5% respectively. Each models includes trend and constant term. Source: Author’s computation.

Before proceeding to other estimations in the study, It is essential to conduct cross sectional dependence test to ascertain the direction to take for the long run estimate. Therefore cross sectional dependence test is conducted.

The result of the cross-section dependence test is based on the correlation matrix of the residual and Breusch-Pagan Lm test of independence. As a result of the possibility of cross sectional dependence among the cross sectional units. It is essential to carry-out cross-sectional dependence test. This is required because most of the African countries share a common characteristic particularly Sub-Saharan African countries.

Table 4.3:
Table 4.3

| | -e1 | -e2 | -e3 | -e4 | -e5 | -e6 | -e7 | -e8 |
|-----|-----------|----------|---------|----------|----------|--------|----------|-------|
| -e1 | 1000 | | | | | | | |
| -e2 | -0.133 | 1.00 | | | | | | |
| -e3 | 0.184611 | 0.1644 | 1.000 | | | | | |
| -e4 | -0.12531 | 0.96145 | 0.20512 | | | | | |
| -e5 | 0.26452 | -0.35113 | 0.13645 | -0.20541 | 1.0000 | | | |
| -e6 | -0.127641 | -0.37774 | -0.1974 | -0.38271 | -0.2986 | 1.000 | | |
| -e7 | 0.14241 | 0.8324 | 0.2217 | 0.8446 | -0.43141 | 0.5321 | 1.000 | |
| -e8 | 0.17621 | -0.6411 | 0.2411 | -0.5231 | 0.16 22 | 0.3411 | -0.46211 | 1.000 |

Source: Author computation

Breusch-Pagam LM test of impendence: Chi 2 (2q) = 183.8421, Pr = 0.9362

Ho: There is no cross-sectional dependence.

Results from table 4.3 shows the results of cross-sectional dependence test. From the results, the null hypothesis of no presence of cross-sectional dependence is accepted as the probability (0.8423) is greater than one 5% level of significance. The implication of these results is that the response of the selected Sub-Saharan Africa countries to their common factors shocks are the same.

The panel unit root test on table 4.2 results from panel unit root test showed that all the variables of interest were not stationary at their levels but became stationary at their first difference. This implies that all the variables of interest are integrated of order 1(1). Based on the results obtained from Panel Unit Root Test, the study therefore proceed to panel error correction co-integration test.

Table 4.4

| Statistics | Value | Z – Value | P – Value |
|------------|---------|-----------|-----------|
| Gt | -9.159 | 0.492 | 0.014 |
| Ga | -0.887 | 4.241 | 1.000 |
| PE | -12.834 | 0.158 | 0.004 |
| Pa | -1.82 | 4.624 | 0.712 |

Source: Author’s computation

Each test included trend and constant terms. The lag and lead lengths are selected based on AIC and Barlett Kernel window width is set according to

which gives approximately 3 in this study
$$4 \left[\frac{4}{n} \frac{1}{2} \right]$$

From results obtained on table 4.4, where two out of the four tests conducted which are designed for testing for panel co-integration indicate a rejection of null hypothesis of no long-run co-movement among the variables of interest. This simply shows that there is long-run relationship among the variables of interest with this results, the study can now proceed to estimate the Error Correction model using the fixed effect within regression.

Table 4.5: Fixed Effect (within) Regression Results of fiscal deficit and monetary Base Variables.

Long-run model

Table 4.5 shows the Error – correction Based panel co-integration regression using the fixed Effect model. The results are divided into two parts. That is, the long-run and short-run. The first part shows the variable in their non-difference forms and thus indicating long-run relationship, while the second segment displays the variables in their differenced forms showing the short-run relationships.

Table 4.5: Long-run model

| Variables | Co-efficient | Standard Error | Probability |
|------------------------|--------------|----------------|-------------|
| BD | | | |
| MS | -0.61417211 | 0.34456021 | 0.342 |
| DOM | -0.66145562 | 0.346142 | 0.141 |
| DIR | 0.6141621 | 0.2245641 | 0.014 |
| IFR | -0.7456211 | 0.456231 | 0.131 |
| Short-run model | | | |
| | | 0.462245 | 0.146 |
| DDOM | -0.05874362 | 0.345623 | 0.0145 |
| DDIR | 0.622451 | 0.621467 | 0.314 |
| DIFR | -0.724132 | 0.6246131 | 0.113 |
| Constant | 138.4351 | | |
| Sigma-v | 2.8745661 | | |
| Sigma-E | 6.456221 | | |
| RHO | 0.176221 | | |

Source: Author’s Computation

From fixed effect regression results on table 4.5, both in the short-run and long-run, monetary variables (money supply and inflation rate) showed negative and insignificant relationship with budget deficit and domestic debt used to capture fiscal policy. The implication of this results is that there is absence of fiscal dominance in sub-Saharan Africa countries during the study period.

F(4.152) = 3.26, prob>F=0.00734

R – Squared within = 0.8462, Between = 0.6221, overall = 0.8631

Table 4.5: VECMLag length selection Result

| Lag | LR | FPE | AIC | SC | HQ |
|-----|-----------|-----------|-----------|-----------|-----------|
| 0 | NA | 2.88e+27 | 77.40412 | 78.37189 | 77.68281 |
| 1 | 160.0766 | 1.84e+24 | 69.91093 | 72.08841 | 70.53797 |
| 2 | 57.67894* | 1.67e+23* | 67.02743* | 70.41461* | 68.00282* |

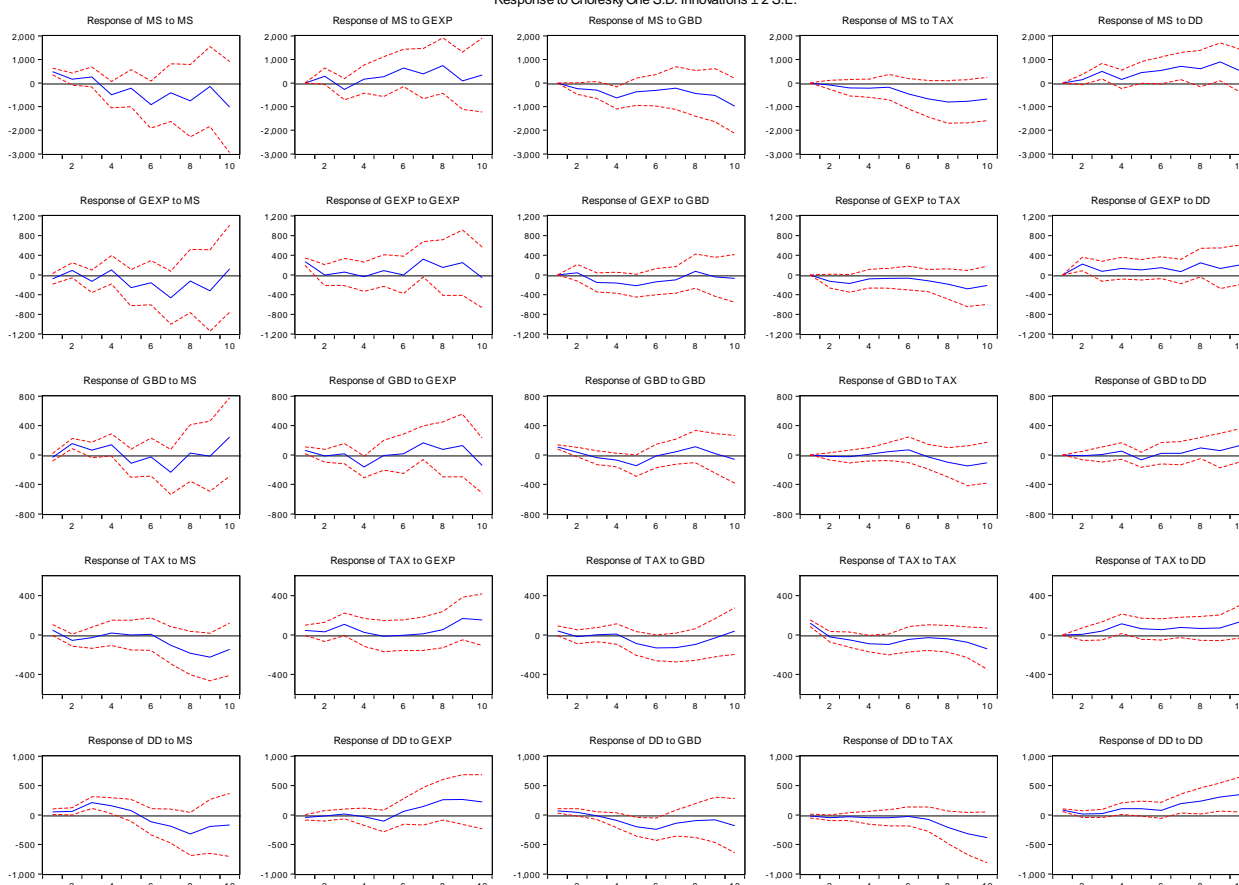
Note: * indicates lag order selected by the criterion, LR: sequential modified LR test statistics, FPE: Final prediction error, AIC: Akaike information criterion, SC: Schwarz information criterion and HQ: Hannan-Quinn information criterion

As shown in table 5, the optimal lag length selection for the VECM estimation is 2, given lowest statistics of 67.02743, 70.41461, and 68.00282 reported for Akaike information criterion (AIC), Schwarz information criterion (SC) and Hannan-Quinn information criterion (HQ) for lag 2. Hence, this study estimated VECM with lag length of two periods

Notably, with the cumbersomeness of the VECM estimation, given the number of included variables and the lag length, the PVECM estimation is by practice interpreted via the impulse response and forecast error variance decomposition. The results are presented in figure 4.1 and table 4.6, alongside post estimation test for validating autocorrelation and heteroscedasticity assumptions of the model.

Figure 4.1: Impulse response

Response to Cholesky One S.D. Innovations ± 2 S.E.



Impulse response estimation presented in chart form in figure 4.1 reflects corresponding response of variables included in the PVAR system to one standard deviation shock in the variables of interest. Given the focus of the study, the major discussion centers on the response of money supply to fiscal variables including government budget deficit, and domestic debt as presented on the first row of figure 2.

The standard deviation shock in money supply fluctuate in a zig-zag pattern in the first three periods moving from the positive region to the negative and back to the positive region in period four. The upward response was maintain up through to period seven after which it reflect a mild decline to the steady state threshold between period eight and ten.

In response to one standard deviation shock in government budget deficit, money supply rallied within the negative region moving from progressively down from in the negative zone from period one up to period ten. In like matter money supply response to one standard deviation shock in domestic debt moved progressively downward in the negative region from period one to period ten. On the other, one standard deviation shock in domestic debt caused a notable upward rise in money supply from the first period to the last period.

Hence, overview of the response of money supply to one standard deviation shock in fiscal variable considered in the study, suggest the absence of fiscal dominance, giving clearly defined directional movement in the level of money supply over a span of ten periods for every occurrence of innovation shock in the fiscal variable examined in the study.

Table 4.6: Summary of Variance decomposition

| Variance Decomposition of MS | | | | | | |
|-------------------------------|----------|----------|----------|----------|----------|----------|
| Period | S.E. | MS | INF | GBD | DIR | DD |
| 1 | 487.4052 | 100.0000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 |
| 10 | 3497.910 | 26.79675 | 12.07745 | 18.46285 | 20.43465 | 22.22830 |
| Variance Decomposition of INF | | | | | | |
| Period | S.E. | MS | INF | GBD | DIR | DD |
| 1 | 280.9539 | 8.320285 | 91.67971 | 0.000000 | 0.000000 | 0.000000 |
| 10 | 1169.106 | 35.76257 | 19.87851 | 10.45299 | 17.41232 | 16.49360 |
| Variance Decomposition of GDD | | | | | | |
| Period | S.E. | MS | INF | GBD | DIR | DD |
| 1 | 130.0061 | 5.893583 | 23.25399 | 70.85243 | 0.000000 | 0.000000 |

| 10 | 653.3970 | 41.41452 | 23.78715 | 13.91667 | 12.17600 | 8.705668 |
|-------------------------------|----------|----------|----------|----------|----------|----------|
| Variance Decomposition of TAX | | | | | | |
| Period | S.E. | MS | INF | GBD | DIR | DD |
| 1 | 145.3921 | 11.79769 | 10.84715 | 8.541396 | 68.81376 | 0.000000 |
| 10 | 607.9176 | 33.66101 | 19.12312 | 14.88259 | 17.30866 | 15.02462 |
| Variance Decomposition of DD | | | | | | |
| Period | S.E. | MS | INF | GBD | DIR | DD |
| 1 | 128.3620 | 18.41709 | 10.37138 | 29.89451 | 2.008465 | 39.30854 |
| 10 | 1165.197 | 22.24408 | 16.56940 | 13.49097 | 22.44042 | 25.25514 |

SOURCE: Author's Computation (2019)

Variance decomposition presented in Table 4.6 reflect the contribution of each of the endogenous variable to forecast error variance in the variable of interest, the summary as presented in table 6 revealed the 1st and 10th period contribution of each corresponding variables to forecast error variance of the variable of interest. Notable as shown in table 6 above, 100% of the forecast error variance in money supply can be accounted for by itself in period 1, while in period 10, it only accounted for 26.79675%, giving up about 12.08% for 18.46 for government budget deficit, 20.43% for domestic debt 22.23% for domestic debt in period 10, which reflect the capacity of fiscal variables in period ten to determine the direction of variation in the level of money supply in the economy, thus existence of fiscal dominance.

91.68% and 19.88% of the forecast error variance in inflation be accounted for by itself at period 1 and period 10, money supply accounted for 8.32% at period 1, and 35.76% at period 10, government budget deficit accounted for 0.0% at period 1 and 10.45% at domestic debt accounted for 0.0% in period 1 and 16.49% in period 10.

70.85% and 13.92% of the forecast error variance in government budget deficit can be account for by itself in period 1 and 10 respectively. Money supply accounted for 5.89% and 41.41% in period 1 and 10, inflation rate accounted for about 23.25% in period 1 and 23.79% in period 10. while domestic debt accounted for 0.0% in period 1 and 8.70% in period 10.

68.81% and 17.31% of the forecast error variance in inflation can be accounted for by itself at period 1 and period 10 respectively, money supply accounted for 11.79% in period 1 and 33.66% in period 10, domestic debt government budget deficit, and money supply accounted for about 10.84%, 8.54% and 0.0% in period 1 and 19.12%, 14.88% and 15.02% in period 10 respectively.

39.31% and 25.25% of the forecast error variance in domestic debt can be accounted for by itself in period 1 and 10 respectively, while money supply, inflation rate government budget deficit for about 18.42%, 10.37%, 29.89%, 2.0% in period 1 and 16.57%, 13.49%, 13.49%, 22.44% and 25.25% in period 10 respectively.

V. Summary and conclusion

This study investigated the presence of fiscal dominance and the effectiveness of monetary policy in Sub-Saharan Africa countries between 1995 to 2018 using Panel Vector Error correction as estimation technique. Data for the study were sourced from various publications such as World Bank database, International Monetary Fund (IMF) data-base and Central Banks of the selected countries. Finding from our empirical estimations showed negative and insignificant responses of monetary policy variables to fiscal policy variables. With this finding, the study therefore, conclude that there is absence of fiscal dominance in the selected Sub-Saharan Africa countries during the study period. The study recommends that both monetary and fiscal policies are required to be used together for the attainment of macroeconomic.

References

- [1]. Abata, M.A., Kehinde, J.S. & Bolarinwa, S.A. (2012). Fiscal/Monetary Policy and Economic Growth in Nigeria:A Theoretical Exploration, International Journal of Academic Research in Economics and Management Sciences, 1 (5); 75-88.
- [2]. Abdulazeez, M. N. (2016).Impact of Monetary Policy on the Economy of Nigeria.Journal of Business and Finance Management Research,2 (10); 163-179.
- [3]. Abounoori, E.,&Zobeiri, H. (2010).Exchange Rate Gap Effect on Economic Growth in Iran.
- [4]. Adedipe, B. (2004), The Impact of oil on Nigeria's economic policy formulation. Paper presented at the Conference of the Nigeria Economic Summit Group. Lagos, June 16 – 17.
- [5]. Adedokun, A. J. (2012). Oil Export and Economic Growth: Descriptive Analysis and Empirical Evidence from Nigeria. Pakistan Journal of Social Sciences, 9(1); 46-58.
- [6]. Adefeso, A.,&Mobolaji. (2010). Do State Fiscal Policies Affect State Economic Growth? Tulane Economics WorkingPaper Series 1107.
- [7]. Adegbite, O.,&Alabi C. (2013). Macro-econometric modeling for the Nigerian economy: A growth–poverty gap analysis. E conomic Modeling 28, 335–350.
- [8]. Aiyagari,R., &Getler, M. (1985).The backing of government bones and monetarism Journal of monetary Economic Vol16, No1, pp 19-44
- [9]. Ajisafe, J.,&Folorunsho, W. (2002). Interest Rate Behaviour and its Relationship with Economic Growth in Nigeria: An Error Correction Model Approach. The Empirical Economics Letters , 245-255
- [10]. .Anyanwu, J.C. (2002).Monetary Economics; Theory and Institutions. Onitsha: Hybrid Publishers Limited.

- [11]. Akanni, O. P. (2007). 'Oil wealth and Economic growth in exporting countries' AERC Research paper 170.
- [12]. Akinwunmi, A. A., & Adekoya, R. B. (2016). External reserves management and its effect on economic growth of Nigeria, *International Journal of Business and Finance Management Research* 4; 36-46
- [13]. Akpakpan, E.B. (1999). "Exchange Rate Depreciation and Currency Substitution in Nigeria", *African Review of Money, Finance and Banking, Supplementary/Issue of Savings and Development, Italy*, 1(4); 13-22.
- [14]. Alawneh, A.M., & Shawaqfeh, G.N. (2015). The Impact of the Fiscal and Quantitative Monetary Policies on the Domestic and Foreign Direct Investment in Jordan: An Empirical Study. *International Journal of Academic Research in Accounting, Finance and Management Sciences*.5(4); 1-10
- [15]. Anderson, V., & Jordon, I. (1960). *Money and Banking*. New Jersey: George Allen and Urwin Limited.
- [16]. Anna Bernanke, B. (2012). Is It Money or Credit, or Both, or Neither? *Credit, Money, and Aggregate Demand. Ame. Economic Reverse Paps. Proceeds*. 78(5): 435-439.
- [17]. Anthony, I. Edeh, C. E., & Wilfred, I. U. (2015). Impact of fiscal policy variables on economic growth in Nigeria (1970-2012): a managerial economics perspective. *Investment Management and Financial Innovations Volume 12, Issue 2*, 168-180
- [18]. Anyanwu, J.C. (1993). *Monetary Economics; Theory and Institutions*. Onitsha: Hybrid Publishers Limited.
- [19]. Apere, T.O. (2017). Impact of Crude Oil on Nigeria's Fiscal Policy Formulation. *European Journal of Research in Social Sciences* 5 (3) 217- 231.
- [20]. Aregbeyeni., & Bashir, (2012). Oil Revenue, Public Spending and Economic Growth Relationships in Nigeria *Journal of Sustainable Development*. 8 (3); 113-123
- [21]. Arbatl, E. (2011). Economic Policies and FDI Inflows to Emerging Market Economies, *IMF Working Paper Middle East and Central Asia Department*, p. 25.
- [22]. Artis, L., & Nrbay, H. (1971). *Modern Economics*, New Delhi: S Chand & Company PVT Ltd.
- [23]. Asbjörn, R. (2002). "Open Economy macroeconomics". Cambridge University Press.
- [24]. Asogu, U.T. (1998). *Monetary policy and development*. Onitsha: Tobansi Press Ltd. Central Bank of Nigeria (CBN), 1993. *Statistical Bulletin and Annual Reports*.
- [25]. Awoseyi, D. A. (1995). Impact of Government Expenditure on Economic Growth in Nigeria. *International Journal of Business and Management Review*, 1 (4), pp. 64-71.
- [26]. Batini, B.S, (2004). The federal funds rate and the channels of monetary transmission. *America Economic. Rev.* 82: 901-921.
- [27]. Baum, A., & Koester, G.B. (2011). The Impact of fiscal policy on economic activity over the business cycle evidence from a threshold VAR analysis, *Discussion Paper Series 1: Economic Studies, No 03/2011, Main*.
- [28]. Babaita, I., Abdulrasheed, A. & Mustapha, (2011). Impact of fiscal and monetary policy on level economics activity in Nigeria, *Lapa. Journal of management science, jms/vol.1.2/0002*.
- [29]. Banga, R. (2003). Impact of Government Policies and Investment Agreements on FDI Inflows, working paper no. 116 Indian Council for Research on International Economic Relations Core-6A, 4th Floor, India Habitat Centre, Lodi Road, New Delhi-110 003.
- [30]. Baum, A., & Koester G.B. (2011). The impact of fiscal policy on economic activity over the business cycle—evidence from a threshold VA analysis, *Deutsche Bundes bank, Wilhelm-Epstein-Straße 14, 60431 Frankfurt am Main, Postfach 10 06 02, 60006 Frankfurt am Main*.
- [31]. Bernanke, B., & Kuttner, K. (2005). What Explains the Stock Market's Reaction to Federal Reserve Policy? *Journal Financial*. 60(3): 1221-1257.
- [32]. Busan, J., Robert L., & Jean-Francois, P. (2002). "Does Exchange Rate Policy Matter for Growth?" *International Finance*, 6(3); 381 - 414
- [33]. Central Bank of Nigeria, (2003). Issues in fiscal management implications for monetary policy in Nigeria. *CBN Third Annual Monetary Policy Conference proceedings*. Lagos. 2(3); 205-230.
- [34]. CBN, (2017). *Central Bank of Nigeria Annual Reports and Statement of Accounts*, CBN Abuja, Nigeria
- [35]. Chigbu, Emmanuel Ezeji., & Njoku, Michael. The Impact of Monetary and Fiscal Policies on Nigerian Economic Growth: 1990-2010. *European Journal of Business and Management*. 5(2); 13-26
- [36]. Cottarelli., & Jaramillo. (2012). Walking Hand in Hand: Fiscal Policy and Growth in Advanced Economies, *International Monetary Fund, IMF Working Paper: WP/12/137*, presented at the Collegio Carlo Alberto of Turin on March 17, 2012.
- [37]. Ezeduji, F.O. (1994). *Conduct of Monetary Management in Nigeria*. Onitsha: Wema Publishers. Fisher, I. (1976). *Natural Rate of Unemployment*. London: Macmillan Press.
- [38]. Falegar, G., (1978). Monetary policy responses to exogenous shocks. *American Economic Review*, 76: 79 - 83.
- [39]. Folawewo, A.O., & Osinubi, T.S. (2006). Monetary Policy and Macro-Economic Stability in Nigeria. *A Rational Expectation Approach: Journal of Social Science*. 12(2); 93- 100.
- [40]. Frantiami, M., & Spinelli, F. (2001). Fiscal dominance and money growth in Italy, the long record exploration in economic history, vol. 38, pp. 252 - 272.
- [41]. Gallo, G.M., & Otranto, E. (1998) "inflation in Italia (1863-1994) Nonlinearity cambiamentid regime" *University differenze Dipartimento di statistical*.
- [42]. Iyoha, Milton. (2005). *Macro-economics for developing nations* University of Benin printing press.
- [43]. Iyioha, M.A. (1996). *Macroeconomics: An African perspectives*. Benin City: Ambik Press Ltd.
- [44]. Jalil, A., Tariq, R., & Bibi, N. (2013). "Fiscal deficit and inflation New evidence from Pakistan using a bounds testing approach" *Economic modelling* Vol 37, pp 120-126
- [45]. Jibrin, M.S., Meshack, I.S., & Ejura, S.B. (2013). The impact of monetary and fiscal policies on the naira exchange rate between 1990 and 2009. *Asian economic and financial review* 3(9); 1214-1231
- [46]. Joins, D.H. (1985). Deficits and money growth in the united states 1872.1983 *Journal of monetary economics* Vol. 16, pp 329-351
- [47]. Joseph, O.A., & Oluwafemi, A. (2018). Empirical Analysis of Fiscal Dominance and the conduct of monetary policy in Nigeria <http://mpr.uh.unimuenchen.de/88789/> mpra paper number 88786.
- [48]. Kazeem, A.S., & Akinlo, A.E. (2016). Investigating Fiscal Dominance in Nigeria. *Journal of Sustainable development* Vol 9 No 1 2016
- [49]. Keran, M.S. (1970). To investigation the relationship between monetary, fiscal Policy and economic growth in Iran: Autoregressive distributed lag approach to co integration, *American Journal of Applied Sciences*, 7 (3), pp. 420-424.
- [50]. Nwezeaku, N.C., & Akujuobi, A.B. (2010). "The Impact of Exchange Rate Fluctuation on Capital Inflow: The Nigerian Experience". *The Nigeria Academic Forum*, 13(2); 142-156
- [51]. Obinna, M.O. (2008). The Monetary Policy Instruments in Nigeria; The Theory Changing Nature and Implication. *Journal of Political Economy*. 21, 2-13.

- [52]. Odedokun, G.O. (1998). Government Expenditure and Economic Growth in Nigeria, *Journal of Economic Management*, 2,(1). Available at: <http://astonjournal.com/bej>.
- [53]. Ogunsakin, S.(2013). Monetary policy and investment behaviour in Nigeria *Journal of inquiry in the Humanities (NITH)* Vol 12 No 1 2016 pg 1-13
- [54]. Ogunsakin,S, O. &Awe,A. A. (2014). The Impact of financial liberalization on the stability of the Nigerian money demand function. *International Journal of Economics, Business and Finance*, 2(1), 1-18.
- [55]. Olugbenga, A.O. &Owoye, O. (2007). Public Expenditure and Economic Growth: New Evidence from OECD Countries. Available at: http://iaes.com/fexcom/iaes/Rome_67/techprogram/si888.htm.
- [56]. Philip, M. (2009).The impact of fiscal policy on foreign direct investments.Parkin, M. (1987), Domestic monetary institutions and deficits.In J. M. Buchanan, C. Rowley, & R. Tollison(eds), *Deficit basic*. (pp 310-337). London: Blackwell.
- [57]. Tavlör, B.J. (2004).“Tax Base Variability and Pro-cyclical Fiscal Policy”, NBER Working Paper No. 7499.
- [58]. Senbet,L. V. (2011). Fiscal Policy Interaction with Private Investment: the Case of theBaltic States, *InzinerineEkonomika-Engineering Economics*, 23 (3), pp. 233-241.
- [59]. Umole, Y.(1985). *Money and banking analysis and policy in the Nigerian context*. London: George Allen &Urwin Ltd
- [60]. Zulkefly, A.K. (2010). Monetary Policy and Firms' Investment in Malaysia: A Panel Evidence, *IUM. Journal of Economics & Management* 18, no. 2, by The International Islamic University Malaysia, pp. 221-253.

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