

Impact Analysis of Money Neutrality on Economic Growth: Study of Developing Economy

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Abstract
Monetary policy has been earliest measure of economic problem and as such money neutrality controversy in a developing economy like Nigeria has been the focal point of this paper. This paper aimed at investigating the impact analysis of money neutrality on the economic growth in Nigeria.. The data were obtained from the CBN statistical bulletin, 2011 and transformed. Econometrics techniques such as Phillips Perron, Johansen co integration, ECM and Granger Causality test were adopted to test the stationarity, co integration, ECM model estimation and the impact of money neutrality on the economic growth in Nigeria. The results revealed that the GDP and other variables were stationary at I(o). Total government expenditure has positive impact on economic growth. Money supplies inversely affect GDP. Finally, the TGE and TGE granger caused GDP. The study recommended that effort should be put in place to policy gearing towards spending on fiscal projects capable of enhancing economic growth in the developing countries.
Keywords: Granger Causality, Unit root, TGE, Monetary, GDP, ECM.

1.0 Introduction

Invariably, money cannot be neutral and of course, does matter greatly in economic causation. The St. Louis (1982) result appears to verify the contentions of frontline monetarists like million Friedman and Mises. Infact Misses (1945) strongly posited that “in a living and changing world, in a world, of action, there is no room left for neutral money. Money is non-neutral or it does not exist”. The question comes back to us once again. Does money matter? From all indications, there appears to be no clear cut agreement from the plethora of empirical works, on the subject, towards the resolution of the controversy based on evidence from developed countries. Related works based on data from developing countries are recognized more in their dearth than otherwise. The need therefore for more evidence from developing countries becomes all the more rife. Against this background, we attempt to contribute to the resolution of the money-Matters debate by making an econometric analysis of the

relationship and causation imperatives between money supply and the relevant macro-economic magnitude such as GDP. A corollary would imply checking out the Keynesian prescription by examining the causal imperatives between GDP and government expenditure. A model containing both the money supply and government expenditure would thus be indicated for a more in-depth analysis.

They money non-neutrality thesis of the monetarists can also be investigated through two additional channels; investigating the relationship between the GDP per capital and financial development represented by measure of financial deepening on one part, and the relationship between the GDP per capital and the capital market window represented by total financial assets to GDP ratio or the ratio of total monetary assets to GDP. The paper is specifically designed to attend to the following objectives:

i. Determine whether or not fiscal policy (measured by government expenditure) impacts aggregate output (measured by the GDP).
ii. Determine the existence or otherwise of long-run equilibrium relationship between GDP, on one part, and money supply and government expenditure on the other.
iii. Determine the existence and direction of causality between total output, money supply and total government expenditure.

2 Review of Related Literature and Approach

A number of approaches have attempted to define money and the compositions of country's money stock. Four approaches have been distinguished namely, the conventional approached, the Chicago approach, the Gurley and Shaw approach, and the Central Bank approach, (Ezirim, 2005).

2.1.1 The Conventional Approach

The conventional approach views money from a functional standpoint, i.e in the light of what money uniquely does? Accordingly, money has been seen as a generalized means of purchasing power that is acceptable as payment for goods and services (Copper and Frazer 1990). Thus, as the common denominator for economic and business transactions, money mediates between vast number of goods and services transacted in the community (Vaish 1982). Thus, what constitutes the money stock of any country would be those mediums that facilitate readily the exchange mechanism and general acceptability (DD) created by commercial banks. In Nigeria, this is defined as M_1.

Thus $M_1 = C + DD$.

It is of note that is the Central Bank of Nigeria's definition, M_1 as the currency outside banks plus privately held demand deposits with the commercial banks and the Central Bank.

2.1.2 The Chicago Approach

The second approach is that championed by the monetary theorists of Chicago University. As propounded by one of their leading spokesmen, Milton Friedman, "money is a temporary abode of purchasing power". The basic argument is that, since there seems to be an imperfect synchronization between income receipts and expenditure streams over time, then money not only function as a medium of exchange, but also as a temporary store of purchasing power. By implication, the total money stock must not be restricted to M_1 as expressed above, but most include any other asset that commands liquidity alien, or near to currency. Those other assets have fixed interest bearing time deposits of commercial banks. This originated the M_2 definition of total money stock. Therefore, $M_2 = M_1 + TD_1$

Where Mi = as defined above

TD_1 = fixed interest bearing time deposits of commercial bank in Nigeria, there is a little variation, not in principle but is content, of what has been described as M_2. For the Central Bank of Nigeria the M_2 definition of money includes M_1 plus quasi money defined as saving and timing deposits with commercial banks, plus total liability of Merchants banks.

In which case the modified M2 can be expressed as $M_2 = M_1 + TD_1 + SD_1 + TDL$

Where M_1 and TD_1 = as defined above.

SD_1 = Savings Deposits with Commercial Bank

TDL = Total Deposit Liability of Merchant Banks

It is also of note that prior to 1998; quasi money did not include the deposit liabilities of merchant banks.

2.1.3 The Gurley Shaw Approach

The Gurley and Shaw introduced another dimension to the definition of money and money supply. Apart from broadening the content of money stock, they added a cardinal element of assigning weights to the various components. Accordingly, they define currency (c) and demand deposits (DD) as claims against financial intermediaries. However, they do not constitute the intermediaries which are close substitutes for money. Such close substitutes include, according to the approach, commercial banks' time deposit, credit institution shares, bonds, etc. They argue that all these are viable alternatives to liquid stores of value to the public. Thus, the money stock is broadened as expressed below

$M_3 = C + DD + TD_1 + SD_1 + S + B + \ldots$

Where S=share of credit institutions, B = Bounds

2.1.4 The Central Bank Approach

Finally, we have the widest view of money as through it were one and same thing as credit funds lent to borrowers. This view has been favoured by central banks of most developed countries, which earned it, the central bank approach. The federal Reserve systems of the united states seems to favour this viewpoint in their definitions of money which comprises bonds, short term U.S. Treasury securities, commercial papers and bankers' acceptances, net to money market mutual holding of these assts.

Thus, we can define M4 as expressed below:

$< = M_4 = M_3 + SB + TS + CP + BA + M_3H$

Where SB = Saving bounds

TS = Short – term Treasury securities

CP = Commercial papers

BA = Bankers' Acceptances

M_3H = Net of money market mutual holding of assets

The underlying reasoning for this proponents claim, between money and other means of financial purchases.

3.0 Research Methodology

This section specifically deals with the methodology of the study. Thus, we highlight the various procedures employed is the study to gather the relevant data desired for the study as were mainly

secondary data. They covered the Period (1972-2010) and obtained from CBN statistical Bulletin (2009 and 2011) and economic journals. Others were obtained from textbooks and websites.

3.1.0 Models and Modeling

Modeling is done from two analyses: the St. Louis output modeling and the Johanson and Jusellius and co-integration procedure. In each case the Granger causality tests would be conducted.

3.1.2 The output Models

The study adopted the VAR modeling procedure implicated in the St. Louis models as well as the Granger causality modeling. The adaptation resulted in expressions 1 through 5 below starting from the basic hypothesis that the total output (Q) represented by the gross domestic product (GDP) of a developing country is a positive function of total money supply (MS) and also a positive function of total government expenditure (TGE), we succinctly state that

$$Q_t = F(MSt, TGEx),\ t > 0),\ f_2 > 0 \qquad 1$$

Following the St. Louis procedure, we can rewrite the monetarism hypothesis derived from equation (1) to have $Q_t = a + u_0 MS_t + u_1 MS_{t-1} + u_2 MS_{t-2} + ... + u_n MS_{t-n} + E_{it}$

$$= a_t \sum u + (-1) + Eit, U + ... > 0 \qquad 2$$

And the Keynesian (or fiscal policy or non-monetarism) hypothesis also derived from equation 91) as

$$Q_t = \beta_0 + U_0 TGE_t + U_1 TGE(-1) + U_2 TGE(-2)\ .$$

3.1.3 The Output Models

The study adopted the VAR modeling procedure implicated in the St. Louis Models as in Equations 2 through 4 (see section 2) below as well as the Granger Causality Modeling. The adaptation resulted in Expressions 7 through 11 below. Starting from the basic hypothesis that the total output (Q) represented by the gross domestic product (GDP) of a developing country is a positive function of total money supply (MS) and also a positive function of total government expenditure (GE), we succinctly state that

$$Q_t = f(MS_t, GE_t): f_1 > 0; f_2 > 0 \qquad 3$$

Following the St. Louis procedure in Expressions 2 and 3 in session 2, we can rewrite the monetarism hypothesis derived from equation (4) to have

$$Q_t = a + \omega_0 MS_t + \varpi_1 MS_{t-1} + \omega_2 MS_{t-2} + ... + \varpi_n MS_{t-n} + E_{it}$$

$$= a + \sum_{i=0}^{n} \omega_{t-1} + E_{it}\omega_t > 0 \qquad 4$$

and the Keynesian (or fiscal policy or non-monetarism) hypothesis also derived from equation (3) as:

$$Q_t = b + \lambda_0 GE_t + \lambda_1 GE_{t-1} + \lambda_2 GE_{t-2} + ... + \lambda_n GE_{t-n} + E_{it}$$

$$= b + \sum_{i=0}^{n} \lambda_{t-1} + E_{it}\lambda_t > 0 \qquad 5$$

Combining (8) and (9) will yield the general output model expressed as:

$$Q_t = cons\tan t + \sum \varpi_1 MS_{t-1} + \lambda_2 GE_{t-1} + ... + E_{it}$$

$$= a + \sum_{i=0}^{n} \omega_{t-1} + E_{it}\omega_t > 0$$

Where: 6

$\varpi_{is} > 0;\ \ \lambda_i < 0\ \ and\ E_{it}$ are stochastic terms

A curious look at equations 4, 5, and 6 reveals that unlike the St. Louis Model, these expressions attempt to relate total output (or income) in Naira or Dollar amounts to total Naira or Dollar amounts of money supply and government expenditure respectively. The St. Louis Model was estimated against growth rates. If we adopt the growth rates in output, money supply and government expenditure over the years, then expression 10 can be rewritten as:

$$\hat{Q}_t = cons\tan t + \sum_{i=0}^{4} \varpi_i MS_{t-1} = \sum \mu_i GE_{t-1} + E_{it} \quad 7$$

Where:

$\varpi_{is} > 0;\ \ \mu_i < 0\ \ and\ E_{it}$

Thus re-stated, equation 7 would hypothesize that growth in the gross domestic product of a country is a positive function of growth in the total money supply and a negative function of the growth in the total government expenditure over time. This drift is not the present emphasis of this paper. What however the paper considers paramount is an examination of the possible effects of the previous level of output on current output. An inclusion of this consideration would lend to a hypothesis that current levels of output are a positive function of previous levels. This will cause the output expression 11 above to be re-written as:

$$Q_t = cons\tan t + \sum_{i=o}^{n} \varpi_1 MS_{t-1} + \sum_{i=o}^{n} \lambda_2 GE_{t-1} + \sum_{i=o}^{n} \delta_1 Q_{t-1} ... + E_{it} \quad 8$$

Expression 8 is used for the purposes of estimations in this paper to investigate the effects of money supply, government expenditure, and previous levels of output on the current output of a typical developing country. The causality implications following Granger (1969) and Granger and Newbold (1979) formulation was examined based on the expression

$$H_t = \sum_{j=i}^{n} a_j H_{t-j} + \sum_{j=1}^{m} \beta_j P_{t-j} + U_t \quad 9$$

The causality model above regresses a variable, H, on lagged values of itself and another variable P. If P is significant, it means that it explains some of the variance in H that is not explained by lagged values of H itself. This indicates that P is causally prior to H and is said to dynamically cause or Granger cause P. With Expression 13 above, the paper determines if money causes output or vice versa; and if government expenditure causes output or the other way round. Also, the possibility of dual causation was also examined.

In this study, we shall adopt the growth rate model:

$$LnGDP_t = \beta_0 + \beta_1 LnMS + \beta_2 LnTGE + \beta_3 LnPRI + \partial(-1) + \varepsilon_t \qquad 10$$

3.3 Estimation Procedure and Data

Estimation procedure in this study employs stationarity of variables using the Phillips-Perron Test, Co integration, ECM and causality test. The various computations would be done with interactive econometrics software- Microfit 4.0.

4.0 Empirical Data Analysis and Discussion of Results

This section discusses the empirical analysis of the data for the study presents in tables below and discusses as follows:

Table 4.1: Unit Root Results

Variables	PP-Test	5% Critical Value	Decision	Conclusion
D(LNGDP) I(0)	-5.4792	-2.9446*	No Unit Root	It is Stationary
D(LNMS) I(0)	72.5568	-2.9399*	No Unit Root	It is Stationary
D(LNTGE) I(0)	7.5760	-2.9499*	No Unit Root	It is Stationary
D(LNPRI) I(0)	-4.9612	-2.9399*	No Unit Root	It is Stationary

E-Views 4.0 Result Output

The table 4.1 shows that there is no unit among the time series when subjected to PP test at level in the time series variables. Gross Domestic Product (LNGDP), Money Supply (LNMS), Total Government Expenditure (LNTGE) and Price (LNPRI) have no unit root at level I(0) as all the calculated PP- test values are greater than the critical value at 5% irrespective of sign difference. In addition, the results of the variable unit root tests show pattern of stationarity at level I(0). This informs co integration and possible VAR model application for model estimation.

Table 4.2 Johansen Co integration Result

Series: GDP MS TGE PRIC
Lags interval: No lags

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.920112	119.3424	47.21	54.46	None **
0.573859	38.47426	29.68	35.65	At most 1 **
0.266972	11.17872	15.41	20.04	At most 2
0.038021	1.240413	3.76	6.65	At most 3

*(**) denotes rejection of the hypothesis at 5 %(1%) significance level
L.R. test indicates 5 co integrating equation(s) at 5% significance level

E-Views 4.0 Result Output

From Table 4.2, the trace statistic and likelihood function values are greater than critical value at both 1% and 5% respectively. This reveals that there is co integration at most 4 with an implication of at least 5 co integrating equations among the variables which were rejected in favour of the alternative hypotheses at 1 per cent critical level. This is because their values exceed the critical values at the 0.01 level which implies that a long-run relationship exists among the variables (LNGDP, LNTGE, LNMS and LNPRI).

Error Correction Representation for the Selected ARDL Model

ARDL(1,0,0,0) selected based on R-BAR Squared Criterion

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Dependent variable is dLnGDP

37 observations used for estimation from 1974 to 2010

****

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
dLnMS	-.085646	.092918	-.92174[.363]
dLnTGE	.61152	.32160	1.9015[.006]
dLnPRI	.59706	16.2284	.036791[.971]
ecm(-1)	-.81726	.16672	-4.9021[.000]

****

R-Squared	.42275	R-Bar-Squared	.37028
S.E. of Regression	302524.8	F-stat. F(3, 33)	8.0560[.000]
Mean of Dependent Variable	5497.0	S.D. of Dependent Variable	381229.0
Residual Sum of Squares	3.02E+12	Equation Log-likelihood	-517.3211
Akaike Info. Criterion	-521.3211	Schwarz Bayesian Criterion	-524.5430
DW-statistic	2.0234		

****

R-Squared and R-Bar-Squared measures refer to the dependent variable, dGDP and in cases where the error correction model is highly restricted, these measures could become negative.

The Error Correction Model is statistically significant at both current year (-1) and previous years. Estimate of β_1 is -0.08565. This implies inverse relationship between LNGDP and LNMS. A unit change in MS will result in about 8.5% decrease in LNGDP. The estimate of β_2 is 0.6115. This implies that there is a direct relationship between the independent variable, Total Government Expenditure (LNTGE), and the dependent variable, LNGDP. This means that unit change in LNTGE will bring about 6.1% percent increase in LNGDP.

The estimated value of β_3 is 0.59705. This shows direct relationship between Consumer Price Index (LNPRI) and Gross Domestic Product (LNGDP). That is, a relative change in LNPRI results in about 59.7% percent increase in Gross Domestic Product (LNGDP).

Investigating the overall significance of the model, the value of F-statistics is 8.0560 and the probability associated with it is 0.000 which is less than 0.05. This means that there exists statistical significance between the LNGDP and the exogenous variables (LNMS, LNTGE and LNPRI). R-squares is 0.42275 implying that the coefficient of determination (R^2) indicates 42.3% which adjudges the model to be averagely fitted. About 37% of variation in the LNGDP can be explained by monetary parameters under study.

To test for the significance of the individual parameter, we apply based on the argument of the rule of thumb; LNMS and LNPRI are not statistically significant to the LNGDP as the t-ratio are less than 2.0. However, the Total Government Expenditure (LNTGE) is statistically significant to LNGDP because the probability of the t-ratio (0.006) is greater than 0.05 at 5% level.

Table 4.4: Granger Causality Result

Granger Causality Tests

Sample: 1972 2010
Lags: 2

Null Hypothesis:	F-Statistic	Probability
MS does not Granger Cause GDP	5.04019	0.01322
GDP does not Granger Cause MS	0.14915	0.86210
TGE does not Granger Cause GDP	2.97728	0.07081
GDP does not Granger Cause TGE	0.00420	0.99581
PRIC does not Granger Cause GDP	0.16972	0.84474
GDP does not Granger Cause PRIC	0.01916	0.98104
TGE does not Granger Cause MS	39.6710	1.3E-08
MS does not Granger Cause TGE	13.3513	0.00010
PRIC does not Granger Cause MS	3.19575	0.05428
MS does not Granger Cause PRIC	1.23409	0.30458
PRIC does not Granger Cause TGE	2.29030	0.12130
TGE does not Granger Cause PRIC	0.62376	0.54375

E-Views 4.0 Result Output

The Granger causality test result in table 4.4 points out how money neutrality controversy are significant in explaining the causal effect on the economic growth in a developing country. The result empirically shows that Money Supply (MS) granger causes GDP but GDP does not granger Money supply (MS). More so, both GDP and TGE do not granger cause each other. These imply no run causality effect of TGE on GDP. In addition, Consumer Price Index (CPI) and GDP do not granger cause each other still implying case of no run relationship. owever, the value of the joint significance implies that the Money Supply is more influencing factors in determining the values of GDP amongst other factors of money neutrality controversy in the developing country. This means what drives economic growth in Nigeria is money supply. We generalize that there is short run relationship between GDP and Money Supply in Nigeria.

5.0 CONCLUSION

The findings from the study shows that an inverse relationship between some LNMS and LNGDP. Direct relationship is established between Total Government Expenditure (LNTGE), LNPRI and LNGDP. Co integrated with the GDP at most 1. Hence, there is long run relationship between money neutrality and economic growth in the developing countries. Therefore, government should strive to sustain policy that is viable and expected to contribute positively to projects development. Since Total government expenditure has direct relationship with GDP, it is a clear indication that government expenditures should given priorities to encourage and boost the GDP which in turns ensure sustainable economic growth and enhance productive activities in Nigeria.

Finally, in favour of our apriori expectation, money supply was inversely related to GDP. It is therefore the opinion of the researcher that government should try to sustain inflation control measures should adopted to check excesses of money supply.

REFERENCES

Asian, Ozgur and Korap, Levent (2007) “Testing Quantity Theory of Money for Turkish Economy” Book Bankao/>k ye Financial Piyasalari Cut, 1, Say>: 2; Pp93-109.

Chew, Michael Surk-young (2009) “The reeded edge and the Philips curve, money neutrality common knowledge, and subjective believes journal of Economic Theory Elsevier B.V. http://www.fags.org/abstracts/economics/.

Ezirim, B. Chinedu (2005). Finance Dynamics, Principles, Techniques and Applications Port Harcourt Markowitz Centre for Research and Development.

Friedman M. (1970). Counter Revolution in Monetary Theory. Chicago University of Chicago Press.

Federal Reserve: Bank of St. Louis (1982). “Revised form of St. Louis Model”. Review, Fed. Reserve Bank of St. Louis, May, P.14.

Gurley, J.G. and Shaw, ES. (1960) Money in A Theory of Finance Washington D.C. Brooking Institution,

Keynes J.M. (1936) The General Theory of Employment, Interest and Money London; T. Macmillan Press Ltd.

Mises, Ludwing von (1945) “The non-neutrality of Money” Paper Delivered to the New York City Economic Club in New York.

Mishkin, Fredric S.A. (1973) Rational Expecctations Approach to Macroeconometrics; Testing policy ineffectiveness and Efficient Market Models. Chicago; University of Chicago Press.

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