Umoru, David; Erhi, Moses A.

Article

St. Louis model for macroeconomic policy determination in relation to employment generation in a developing economy : some simulation results

Academic journal of economic studies

Provided in Cooperation with:
Dimitrie Cantemir Christian University, Bucharest

Reference: Umoru, David/Erhi, Moses A. (2017). St. Louis model for macroeconomic policy determination in relation to employment generation in a developing economy : some simulation results. In: Academic journal of economic studies 3 (3), S. 24 - 32.

Academic Journal of Economic Studies
Vol. 3, No. 3, September 2017, pp. 24–32
ISSN 2393-4913, ISSN On-line 2457-5836

St. Louis Model for Macroeconomic Policy Determination in Relation to Employment Generation in a Developing Economy: Some Simulation Results

David Umoru[1], Moses A. Erhi[2]

[1]Edo University, Faculty of Arts, Management and Social Sciences, Iyamho, Edo State, Nigeria, [1]E-mail: david.umoru@yahoo.com
[2]Benson Idahosa University, Department of Economics, Banking and Finance, Edo State, Nigeria

Abstract *This study uses St. Louis model to econometrically answer the question of whether the Keynesian policy or the Monetarist's policy was more efficacious on employment generation in Nigerian with quarterly data for sample period of 1992 to 2016. The empirical finding is that cumulative effects of Keynesian of increasing aggregate government spending on the growth rate of employment in Nigeria is dominant in contrast to Monetarist's policy. The policy simulation results reported negative dynamic multiplier of -0.01 of monetary policy on employment; fiscal policy gave a dynamic employment multiplier of 0.12 respectively. The study thus bears out fiscal policy as more effectual in inducing employment in Nigeria by imposing positive feedbacks. The study remarks on feasible implementation of empirical finding.*

Key words Employment, St. Louis model, fiscal policy, monetary policy, Nigeria

JEL Codes: E52, E60, E68

1. Introduction

Policy makers are most often confronted with the task of stabilizing prices, stimulating growth and creating employment (Andersen and Jordan 1968). This arises due to theoretical developments have it that government and monetary authorities exert independent influences on market system through public spending and money stock. This is why the monetary-fiscal policy debate has gained the attention of economists and policy makers.

Even when considerable research has been devoted to the empirical test of both policies, no general consensus on the policy that is more potent in influencing growth of employment. Much of the research works done so far were triggered by the controversial results obtained from studies using St. Louis relation in America.

The debate dwells on validating or invalidating the St Louis model results. In the regard that the findings of studies in some nations are inconclusive, we are motivated to re-examine relative effectiveness of fiscal and monetary policies in influencing employment in Nigeria. The choice of Nigerian economy took a lift from the fact that the country is largest in Africa. Even at that, the country is bedeviled by a chronic unemployment problem. The literature is reviewed in section two. Section three highlights theoretical framework with model specification and data sources. Section four explains the results. Finally, conclusion is in last section.

2. Literature review

These recent studies, Nijkamp and Poot (2002), Dar-Atui and Amirkhalkhali (2002), Algan (2002), Ewing, Levernier and Malikin (2002), Ajisafe and Folorunso (2002), Berument, Dogan and Tansel (2006), Omitogun and Ayinla (2007), Alexius and Holmlund (2007), Mansouri (2008), Shahid *et al* .(2008), Adefeso and Mobolaji (2010), Khosravi and Karimi (2010), Jawaid, Arif and Naeemullah (2010), Simorangkir and Adamanti (2010), Philip (2009) and Medee and Nenbee (2011), Mahmood and Sial (2011), Senbet (2011), Sanni *et al.* (2012), Ogege and Shiro (2012), Effiong (2012), Ezigbo (2012), Munongo (2012), Anna (2012), Enahoro (2013) have all investigated the comparative efficiency of both policies in countries using St. Louis model.

Shahid *et al.* (2008), Adefeso and Mobolaji (2010), Anna (2012), Ezigbo (2012) validated the effectiveness of monetary policy for the economy of Zimbabwe. The empirical findings of Mahmood and Sial (2011), Simorangkir and Adamanti (2010), Effiong (2012) supported effectual policy mix for the economies of Indonesian, Pakistan and Nigeria respectively. Sanni *et al*. (2012) upholds the empirical findings of Enahoro (2013) that policy mix remains the panacea to the attainment of economic prosperity. Many studies have confirmed the relevance of fiscal action in rejuvenating economic performance (Philip 2009; Medee and Nenbee 2011; Munongo, 2012). These studies revealed the important role of government spending in accounting growth.

While Olawunmi and Tajudeen (2007) found government expenditure as a veritable instrument for achieving aggregate demand consistently with full employment growth, Ajisafe and Folorunso (2002) upholds the fact that monetary policy rather than fiscal policy exerts a great impact on economic activity in Nigeria. Nijkamp and Poot (2002) found that twenty-nine percent out of forty-one studies indicate a negative relationship linking fiscal action to full employment growth; seventeen

percent shown positive relationship and fifty-four percent of the studies found an inconclusive relationship involving fiscal action with productive employment.
Dar-Atui and Amirkhalkhali (2002) found that in the endogenous growth model, fiscal action remains the most significant variable that explains full employment growth. In panel data study, Senbet (2011) found countries with enormous government expenditure have a propensity to induce higher employment growth. Omitogun and Ayinla (2007) found empirical evidence in support of usefulness of fiscal action. The empirical results of Mansouri (2008) showed existence of a long-run link connecting fiscal measures to productivity growth. Khosravi and Karimi (2010) found that fiscal action is a useful instrument for stimulating employment and growth.

3. Methodology of research

3.1. Keynesianism vs. Monetarism: Theory of Policy Determination

Theoretical framework of the study is rooted on Friedman's theory of money stock and Keynesian theory of government expenditure. Friedman's theory of money eludes that adjustment in money stock affect the economy through prices, interest rates and spending (Friedman, 1954; Bernanke and Reinhart, 2004). When an adjustment in monetary base of the economy, investment spending would rise given changes in interest rate relative to the supply price of capital (Chowdhury, 1986; Snyder and Bruce, 2003).
To the monetarists, monetary authority ought to target growth in a monetary quantity from monetary base to intermediate aggregates. In practice, the upshot to dedicating monetary action to price stability is the systematic unresponsiveness to real macro-economic outcomes such as growth of employment rate (Rakic, Pesic and Radjenovic, 2012). Conversely, the Keynesian theory asserts that when the government changes the levels of taxation and spending, it influences aggregate demand plus economic activities (Keynes, 1936, Miller and Russek, 2003).
To achieve full employment growth, the government uses fiscal policy to control aggregate demand. In framework of fine-tuning, the theory is that the government and central banks uses both policies to boost employment provided that the government is able to curtail its own borrowing and monetary action is credible in the hands of independent central bank so that people's expectations of inflation are controlled.

3.2. St. Louis Model

The study specified the St. Louis model to measure the short-term relative effects of *Keynesianism* and *Monetarism*. While expansionary fiscal action is measured by increased aggregate government spending, expansionary monetary action is measured by increased money stock in circulation. The original St. Louis relation as specified in equation (3.1) consist of narrow money *(M)* and government expenditure *(G)* as the exogenous variables. Nominal GNP *(Y) is* the endogenous variable and it is the indicator of full employment growth.

$$\Delta Y_t = \Phi + \sum \beta_i \Delta M_{t-i} + \sum \gamma_i \Delta G_{t-i} + u_t \quad (1)$$

St Louis relation in its original form is heteroskedastic, our contribution to knowledge here thus derived is that we transformed our St. Louis relation into a natural logarithmic model before taking the first difference of the fiscal and monetary variables. Also, original St. Louis equation focuses on narrow money alone, this we acknowledged as a misspecification because monetary activities of central banks are not completely reflected by the narrow money variable but at least, the broad money in circulation. Thus, our modified St. Louis relation is k-period distributed as re-specified below.

$$\Delta Ln(E_j) = \Theta + \sum_{j=0}^{k} \xi_j \Delta Ln(M_{t-j}) + \sum_{j=0}^{k} \zeta_j \Delta Ln(G_{t-j}) + \mu_t \quad (2)$$

Where: $\sum_{j=0}^{k} \xi_j = \xi_0 + \xi_1 + \xi_2 + \ldots + \xi_k = \xi \qquad \sum_{j=0}^{k} \zeta_j = \zeta_0 + \zeta_1 + \zeta_2 + \ldots + \zeta_k = \zeta$

By definition, *E* is growth of employment, *M* is the vector of past and present broad money in circulation, *G* is the vector of past and present government spending, μ_t is the disturbance term which is highly stochastic.

3.3. Method of Data Analysis

The study adopts the Batten and Hafer method that gives the cumulative effects of both fiscal and monetary policies (Batten and Hafer 1983). Since our modified St. Louis model is k-period distributed (Batten and Thornton, 1983a), the marginal effects of the policy variables are given by ξ_0 and ς_0 which contemporaneously articulates variation in mean value of employment against a percentage variation in government spending and money stock for equivalent period.

For purpose of simulation, changes in fiscal spending with money stock are kept the same such that the proportion of variation in employment that is respectively explained in the delayed period by the model would be given by $\sum_{j=0}^{k} \xi_j$ and $\sum_{j=0}^{k} \zeta_j$ such that at end of k-period and provided the sum of model parameters exists, it is the *overdue multiplier effect* of the policy variables that would be derived. The study obtained the *standardized estimates* of St. Louis relation as $\xi_j^S = \xi_j / \sum \xi_j, \ \ \zeta_j^S = \zeta_j / \sum \zeta_j$. The St. Louis relation was estimated with the Generalized Least Squares (GLS) with heteroskedasticity-and-autocorrelation-consistent (HAC) covariance matrix estimator. The HAC standard errors were estimated over the bandwidth grid of 2.365 using the Bartlett for the Newey-West estimate with a zero Whitening order. The HAC estimator was chosen to correct for the bias in the OLS standard errors due to non-spherical innovations and so supply more robust scenery for inference about the significance of OLS coefficients. Time series data on government spending, money stock and employment were sourced from the CBN publications of various issues. The Phillips-Peron test was conducted to ascertain the time series properties of the variables. The study also tested for multicollinearity using the variance inflation factor (VIF) on the basis of the following standardized correlation coefficient matrix and the matrix of regressors:

$$R = \begin{bmatrix} 1 & r_{12} \ldots & r_{1k} \\ r_{21} & 1 \ldots & r_{2k} \\ r_{k1} & r_{2k} & \ldots 1 \end{bmatrix} \qquad Z = \begin{bmatrix} z_{11} & z_{12} \ldots & z_{1k} \\ z_{21} & z_{22} \ldots & z_{2k} \\ z_{n1} & z_{n2} & \ldots z_{nk} \end{bmatrix}$$

Given the linear form of our empirical model, with *k* explanatory variables:

$$\Delta E_t = \delta_0 + \delta_1 Z_{1J} + \delta_2 Z_{2j} + \delta_3 Z_{3J} + \delta_4 Z_{4J} + \ldots + \delta_K Z_{KJ} + \mu_t \tag{3}$$

Accordingly, the variance of the estimated coefficient δ_j is:

$$Var(\delta_j) = \frac{S^2}{(n-1)\sum_{j=2}^{n}(Z_{jk} - \overline{Z}_j)^2} \tag{4}$$

The standard error of the regression estimate (s.e.e) is the square root of the *j+1* element of $S^2\,[Z' Z]^{-1}$, where S^2 is the root mean squared error, that is, an unbiased estimator of the true variance of the error term, σ^2, Z is the regression matrix, $Z_{i,i+1}$ is the value of the j^{th} policy variable for the i^{th} sample observation. The estimated variance of the regression estimate of β_j, can as a result be equivalently expressed as:

$$Var(\delta_j) = \frac{S^2}{(n-1)\sum_{j=2}^{n}(Z_{jk} - \overline{Z}_j)^2} \cdot \left(\frac{1}{1-R_j^2}\right) \tag{5}$$

Where R_j^2 is the coefficient of determination for the regression of Z_j on other regressors, that is, the regression of one policy variable on other policy variables in which the regress and is omitted. This distinctiveness separates the influence of several distinct factors on the variance of the coefficient estimate. The *VIF* confines all other factors that control the uncertainty in the coefficient estimates. The *VIF* is equal to one when the vector Z_j is orthogonal to each column of Zmatrix for the regression of Z_j on other regressors. Intuitively, the *VIF* exceeds one when the vector Z_j is not orthogonal to all columns of Zmatrix for the regression of Z_j on other regressors.

The scale of $Var(\delta_j)$ is determined as the ratio, $\frac{Var(\delta_j)}{Var(\delta_j)_{\min}}$ and it equals *VIF* of the jth predictor variable. So,

$$\frac{Var(\delta_j)}{Var(\delta_j)_{\min}} = \frac{\dfrac{S^2}{(n-1)\sum_{j=2}^{n}(Z_{jk} - \overline{Z}_j)^2} \cdot \left(\dfrac{1}{1-R_j^2}\right)}{\dfrac{S^2}{(n-1)\sum_{j=2}^{n}(Z_{jk} - \overline{Z}_j)^2}} \tag{6}$$

Thus, the study calculates *k* different VIFs, one for each Zon other regressors Z_i) in three steps: Firstly, we ran an OLS that has Z_i as function of other regressorsa s follows:

$$Z_{1J} = \phi_0 + \phi_2 Z_{2J} + \phi_3 Z_{3J} + \phi_4 Z_{4J} + \phi_5 Z_{5J} + \varepsilon_{1t} \quad (7)$$
$$Z_{2J} = \beta_0 + \beta_1 Z_{1J} + \beta_3 Z_{3J} + \beta_4 Z_{4J} + \beta_5 Z_{5J} + \varepsilon_{2t} \quad (8)$$
$$Z_{3J} = \pi_0 + \pi_2 Z_{2J} + \pi_1 Z_{1J} + \pi_4 Z_{4J} + \pi_5 Z_{5J} + \varepsilon_{3t} \quad (9)$$
$$Z_{4J} = \omega_0 + \omega_2 Z_{2J} + \omega_3 Z_{3J} + \omega_1 Z_{1J} + \omega_5 Z_{5J} + \varepsilon_{4t} \quad (10)$$
$$Z_{5J} = \eta_0 + \eta_2 Z_{2J} + \eta_3 Z_{3J} + \eta_4 Z_{4J} + \eta_1 Z_{1J} + \varepsilon_{5t} \quad (11)$$

Where Φ_0, β_0, π_0, ω_0, η_0 regression intercepts and ε_{1t}, ε_{2t}, ε_{3t}, ε_{4t}, ε_{5t} *are* the stochastic disturbances. Secondly, we calculated VIF factor for δ_j with the following formula:

$$VIF(\delta_j) = \frac{1}{1 - R_j^2} \quad (12)$$

Where R^2_i is the coefficient of determination of each of the regression equations in step one.

Thereafter, we analyzed magnitude of multicollinearity by considering size of the VIF(δ_j) on the basis of the rule that if VIF(δ_j)>10, then multicollinearity is high. The square root of the variance inflation factor evaluates how much larger the standard error is, compared with what it would be if that variable were uncorrelated with other regressors of the model.
Since $(Z)'(Z)=R$, the least squares estimates of $\delta=(\delta_1,\ldots,\delta_k)$ is given by $\delta = R^{-1}(Z)'W$ such that Cov $(\delta) = R_{-1}(\sigma)^2$. If all regressors are uncorrelated then $R = I_k = R^{-1}$. So the j^{th} diagonal element of R^{-1} is a gauge of variance of regression coefficient that is inflated owing to link with all the regressors in the model.
Accordingly, the largest i^{th} variance inflation factor, VIF=$(1-R^2)^{-1}$ is taken as measure of the gravity of the multicollinearity among the regressors, with $\max_i$ VIF>10 indicating that multicollinearity is overly affecting estimates of the regression coefficients. Consistency was made certain by Wald test for joint significance of every policy variables. The study exploits annual data sourced from the CBN's data base which was accessed through the bank's official website.

4. Empirical analysis

Table 1 shows the Phillips-Peron test results whereby the lag order was determined by Newey-West criterion. The results of PP test authenticate stationarity at first difference. Given that no variable was stationary at level, the regression was done with variables in the first difference form. Table 2 presents the Johansen co-integration test results. The maximum lag length selected for the co-integration test is one.

Table 1. Phillips-Peron Stationarity Test Results

Variables	*Level*	*Transformation/Order*	*R^2*	*PP Critical Value @ 5%*	*Results*
Ln(M)	*-1.2357*	*-11.593, I(1)*	*0.5*	*-3.975*	*First difference stationary*
Ln(G)	*-2.5789*	*-19.367, I(1)*	*0.2*	*-3.975*	
Ln(F)	*-1.4267*	*-21.845, I(1)*	*0.4*	*-3.975*	
Ln(E)	*-1.6589*	*-25.945, I(1)*	*0.6*	*-3.975*	

Source: Author's results

The co-integration test encompasses a trend and constant estimation. With our results, variables are co-integrated by one rank and this is validated at 5% significance level as indicated by *f*. Consequently, the linear unification of variables which were found to be integrated of order one became stationary.

Table 2. Johansen Co-integration Test and Lag-Length Selection Results

Co-integration rank	*Trace Statistic*	*Eigenvalue*	*5% Critical Value*	*VAR Lag Length*
0	*353.6*	*0.393*	*325.8*	*1*
1	*248.2[f]*	*0.426*	*226.6*	
2	*152.4*	*0.265*	*159.5*	
3	*142.3*	*0.228*	*175.2*	

Source: Author's results

The St. Louis model estimates are reported in Table 3. The estimated coefficients with * and ** indicates the marginal coefficients and delayed coefficients respectively. The marginal effect of the variation in money supply on employment generation is *-1.056*. Such marginal effect due to monetary action is negative. In particular, a 10 percent variation in money stock reduces employment by exactly *10.56* percent variation.

Also, the overdue effects of monetary policy on employment for previous one year and two years are negative while the delayed effect for last three years is positive. In accordance with results, the overdue effect of money stock reduces with passage of time. The negative feedback effect of monetary action for the previous one year and two years could be indicative of negligible level of overall success of monetary policy in rejuvenating economic activities due to lack of CBN independence. Evidently, the degree of efficacy of the delayed multipliers of money stock on growth rate of employment declines in relation to the duration length of the delay. The implementation of monetary action suffered a major interference especially when the monetary effect even became negative for periods, previous one year and two years respectively and also looses statistical significance for the same periods.

With an error tolerance of one percent, the model reported a significant monetary effect for only the previous three years while with an error margin of five percent, only the monetary effect of current year was statistically significant. This point to irregularity of policy effect and consequently the incompatibility of monetary action with employment generation.

The marginal effect of the variation in fiscal policy on employment generation is *0.576*. In particular, ten percent variation in government spending generates employment by exactly *5.76* percent variation. The marginal fiscal effect is positive. The overdue effects of government spending for previous one year, two years and previous three years are *1.329, 1.572* and *0.048* respectively. Undeniably, the overdue effects of government spending on employment are positive all through the years of our study. This implies fiscal policy stability and consistency.

The St. Louis model estimates subsequently depict positive linear association between Keynesian fiscal action effect and employment creation in Nigeria. With exception of previous three years, the overdue effects of the Keynesianism policy increases progressively. This shows no similarity with the delayed monetary policy effect whose size of effect declines as the delay period increases not including the previous three years however.

Given the low error of estimate of *0.002*, it thus implies an accurate measure of average relationship of distribution around the predicted and actual employment generated having implemented the two macroeconomic policies for the Nigerian economy. The *F-statistic* stood at *39.2*. So, the overall significance of estimated St. Louis model is acceptable even at the conservative one percent level. In passing, hypothesis of an infinitesimal and hence lack of a positive linear relationship between employment generation and macroeconomic policy implementation is rejected in favour of the alternative of a monumental relationship. In validation, *76.9%* of the general variation in the growth rate of employment was caused by the variation in fiscal and monetary policies having adjusted for degrees of freedom in the estimation process. Only a minute variation of *23.1%* in the growth rate of employment is elucidated by other macroeconomic policies outside the prediction of Keynesians and Monetarists. The *Durbin-Watson statistic* of *2.049*, the St. Louis model estimates are statistically reliable and economically meaningful and robust to stand the test of time for economic forecasting.

Table 3. St. Louis Model Estimates

Parameters	*Coefficient Estimates*	*Remarks*
Θ	*0.629*	*
ξ_0	*-1.056**	*
ξ_1	*-0.438***	**
ξ_2	*-1.257***	**
ξ_3	*1.963***	**
ζ_0	*0.576**	*
ζ_1	*1.329***	**
ζ_2	*1.572***	**
ζ_3	*0.048***	**
Parameters	*Standardized Estimates*	*Remarks*
ξ_0	*1.340101523*	*
ξ_1	*0.5558375635*	**
ξ_2	*1.595177665*	*

ξ_3	*-2.491116751*	**
ζ_0	*0.1634042553191*	*
ζ_1	*0.3770212765957*	*
ζ_2	*0.4459574468085*	**
ζ_3	*0.0136170212765*	**

Source: Author's results

Table 4 shows the cumulative effects of both fiscal stance and monetary policy. From the cumulative coefficients, cumulative effect of the variation in money stock is *-0.788* while the cumulative effect of the variation in aggregate government spending is *3.525* respectively. Intuitively, a negative cumulative coefficient is indicative of policy somersault, inconsistency and hence irregularity of policy effect.

As it were, monetary effect of employment generation in Nigeria is contrary to policy objective. Accordingly, a comparison of the cumulative effects of variation explained by both policies of increasing government spending with money supply shows that the efficient policy is Keynesian expansionary fiscal policy, not the Monetarist's expansionary policy.

The policy implication is straightforward; the St. Louis model estimates reveal that Keynesian policy of increasing government spending had more efficacious impact on employment generation in Nigeria in the past. Fiscal policy impacted significant positive short-run effect on employment as against the significant negative short-run effect of monetary policy. This lay credence to fiscal policy as more effectual in stimulating growth rate of employment by imposing positive feedbacks.

Table 4. St. Louis Model Estimates

Parameters	*Cumulative Effects of Policy Preference*
$\sum_{j=0}^{3} \xi_j \Delta Ln(M_{t-j})$	*-0.788*
$\sum_{j=0}^{3} \zeta_j \Delta Ln(G_{t-j})$	*3.525*
Parameters	*Standardized Cumulative*
$\sum_{j=0}^{3} \xi_j \Delta Ln(M_{t-j})$	*1*
$\sum_{j=0}^{3} \zeta_j \Delta Ln(G_{t-j})$	*1*

Source: Author's results

The study conducted policy simulation by dynamically simulating effects of N80 million persistent increases in government spending and money supply on employment generation in Nigeria over sample period of 2010 to 2015. Results of controlled and disturbed solutions are found in Table 5. The simulation results show N80 million increases in fiscal spending generated a mean percentage increase of *9.5%* in employment while such N80 million increase in money stock generated a mean percentage decline of*1.02%*.

Table 5. Policy Simulation Results for Employment Generation in Nigeria

Endogenous Variable	*Periods*	*Controlled Solution*	*Disturbed Solution*		*Employment Multiplier of Government Expenditure*	*Employment Multiplier of Money Supply*	*Employment increase due to changes in government spending*	*Employment increase due to in changes in money supply*	*Percent (%) increase in employment due to changes in government*	*Percent (%) increase in employment due to changes in money supply*
			Changes in Government Spending	*Changes in Money Supply*						
Employment	2010Q1	5,692,432	6,892,837	5,792,837	0.015005063	0.001255063	1,200,405	100,405	21.08773544	1.763833103
	2010Q2	6,287,231	6,987,292	6,587,292	0.008750763	0.003750763	700,061	300,061	11.13464735	4.772546134
	2010Q3	6,582,143	7,282,973	6,982,973	0.008760375	0.005010375	700,830	400,830	10.64744415	6.089658034
	2010Q4	7,626,352	7,926,382	7,726,382	0.003750375	0.001250375	300,030	100,030	3.934122107	1.311636284
	2011Q1	7,942,135	8,145,656	8,249,656	0.002544013	0.003844013	203,521	307,521	2.562547728	3.8720193
	2011Q2	8,679,314	8,739,334	8,779,334	0.00075025	0.00125025	60,020	100,020	0.691529308	1.152395224
	2011Q3	8,654,126	8,754,656	8,954,656	0.001256625	0.003756625	100,530	300,530	1.161642435	3.472678812
	2011Q4	9,246,259	9,526,839	9,346,839	0.00350725	0.00125725	280,580	100,580	3.034524557	1.087791289
	2012Q1	9,352,262	9,462,732	9,452,732	0.001380875	0.001255875	110,470	100,470	1.181211561	1.074285558
	2012Q2	9,363,274	9,763,054	9,563,054	0.00499725	0.00249725	399,780	199,780	4.269660377	2.133655386
	2012Q3	94,521,436	9,832,736	9,652,736	(1.05860875)	(1.06085875)	(84,688,700)	(84,868,700)	(89.5973)	(89.78778105)
	2012Q4	9,505,427	9,945,387	9,675,387	0.0054995	0.0021245	439,960	169,960	4.628513795	1.788031195

	2013Q1	9,625,124	10,152,474	9,752,474	0.006591875	0.001591875	527,350	127,350	5.478890454	1.323099837
	2013Q2	10,046,113	11,246,803	11,246,803	0.015008625	0.015008625	1,200,690	1,200,690	11.95178673	11.95178673
	2013Q3	12,904,234	13,904,864	13,204,864	0.012507875	0.003757875	1,000,630	300,630	7.75427662	2.329700469
	2013Q4	13,485,474	14,485,954	13,585,954	0.01250600	0.0012560000	1,000,480	100,480	7.418945749	0.745098022
	2014Q1	14,658,216	14,958,346	14,538,346	0.003751625	(0.00150000)	300,130	(119,870)	2.047520653	(0.817766637)
	2014Q2	17,585,355	17,785,675	16,724,675	0.002504	(0.010758500)	200,320	(860,680)	1.139129691	(4.894299831)
	2014Q3	17,956,298	18,356,468	17,856,468	0.005002125	(0.001247875)	400,170	(99,830)	2.228577405	(0.555960922)
	2014Q4	18,393,756	19,393,756	18,259,756	0.012500000	(0.001675000)	1,000,000	(134,000)	5.436627516	(0.728508087)
	2015Q1	18,567,692	29,767,692	18,367,692	0.14000000	(0.002500000)	11,200,000	(200,000)	60.31982866	(1.077139797)
	2015Q2	18,935,464	29,935,464	18,593,526	0.13750000	(0.004274225)	11,000,000	(341,938)	58.09205415	(1.805807346)
	2015Q3	19,374,656	29,374,656	18,759,465	0.125000000	(0.007689888)	10,000,000	(615,191)	51.61381962	(3.175235731)
	2015Q4	19,936,356	29,536,356	18,954,635	0.120000000	(0.012271513)	9,600,000	(981,721)	48.15323322	(4.924275028)

Source: Author's results

The impact multipliers on employment are *0.015*and *0.001*given the sustained N80 million increase in both government spending and money supply respectively from 2010 - 2015. The policy simulation results show that the impact multiplier is the same for both fiscal and monetary policies. However, while fiscal policy gave a dynamic employment multiplier of *0.12*, monetary policy gave a negative dynamic multiplier of -*0.01*.

These policy effects validate the St. Louis model estimates. Consequently, monetary policy implemented so far did not enhance employment creation in Nigeria. To control for possible multicollinearity between the current and past values of the policy variables which may distort the validity of the estimated results; we estimated variance inflation factors. The results show that multicollinearity does not exist in the St. Louis model as reported in Table 6.

Table 6: Variance Inflation Factors

Variable	*VIF*
$\Delta Ln(M_t)$	*5.62*
$\Delta Ln(M_{t-1})$	*6.23*
$\Delta Ln(M_{t-2})$	*7.28*
$\Delta Ln(M_{t-3})$	*8.52*
$\Delta Ln(G_t)$	*8.53*
$\Delta Ln(G_{t-1})$	*5.42*
$\Delta Ln(G_{t-2})$	*8.22*
$\Delta Ln(G_{t-3})$	*6.56*

Source: Author's results

The Ramsey RESET test rejects the hypothesis for possible omitted variables at the five percent level as shown in upper bloc of Table 6. With a RESET statistic of *4.162*, there are no specification errors or structural breaks. In the lower bloc of Table 7, the computed Elliott-Muller test statistic of *-20.539* which passes the test of significance after accommodating an error margin of just one percent, shows evidence of stability of model estimates and hence valid estimates.

Table 7: Ramsey RESET Test for Omitted Variables/Elliot-Muller Test Results

Ramsey RESET Test using Powers of the Fitted values of Employment		
H_o	*F-value @ 5%*	*P-value*
No omitted variables	*4.162*	*0.0004*
Elliot-Muller Test Statistic		
Test statistic	*Critical value @ 5%*	*Critical value @1%*
-20.539	*-25.746*	*-26.928*

Source: Author's results

5. Conclusions

We estimated the St. Louis equation for the relative strength of fiscal and monetary policies in influencing employment in Nigeria. The empirical finding upholds Keynesian expansionary fiscal policy as effectual policy for employment generation in Nigeria. In the present Nigerian economic situation, government spending is the indispensable instrument for building full employment growth framework. In fact, further reducing government spending only reduces aggregate demand with a contrasting effect on the economy. Emphasis should be on government spending as this could enhance the performance of the non-oil sector in creating more employment. This the study so recommends as a policy.

Prominently, such dominant effects of fiscal action over monetary policy as reflected in irregularity of the monetary effect is attributable to lack of independence of the CBN in operational terms, but rather under the "political will" of the government as in Nigeria. In fact, the empirical finding could be reflecting central bank which in reality has lost its power of monetary control due to excessive political measures.

References

Adefeso, H.A. and Mobolaji H.I. (2010), 'The Fiscal-Monetary Policy and Economic Growth in Nigeria: Further Empirical Evidence.' *Pakistan Journal of Social Sciences*, 7(2): 137-142.

Anna, G. (2012). 'The Relative Effectiveness of Monetary and Fiscal Policies on Economic Activity in Zimbabwe 1981:4 – 1998:3): An Error Correction Approach.' *International Journal of Management Sciences and Business Research*, 1(5): 1-35.

Adeoye, T. (2006). Fiscal Policy and Growth of the Nigerian Economy. NISER Monograph Series.

Ajisafe, R.A and Folorunsho, B.A (2002),The Relative Effectiveness of Fiscal and Monetary Policy in Macroeconomic Management in Nigeria. *African Economic and Business Review*, 3(1). Spring

Algan, Y. (2002), "How Well Does the Aggregate Demand-Aggregate Supply Framework Explain Unemployment Fluctuations? A France-United States Comparison", *Economic Modeling*, 19, 153-177.

Alexius A. and B. Holmlund (2007) "Monetary Policy and Swedish Unemployment Fluctuations", *IZA Discussion Paper*, No. 2933.

Andersen, L. and J. Jordan (1968), "Monetary and Fiscal Actions: A Test of Their Relative Importance in Economic Stabilization," *Federal Reserve Bank of St. Louis Review,* 50, 11-24

Batten, D., and R. Hafer (1983), "The Relative Impact of Monetary and Fiscal Actions on Economic Activity: A Cross-Country Comparison," *Federal Reserve Bank of St. Louis Review*, 65 (1), 5-12.

Batten, D. and D. Thornton (1983a), "Polynomial Distributed Lags and the Estimation of the St.Louis Equation," *Federal Reserve Bank of St. Louis Review*, 65 (1), 13-25.

Bernanke B, and V.R. Reinhart (2004), "Conducting Monetary Policy at Very Low Short-Term Interest Rates", *American Economic Review*, 94(2), 85-90.

Berument H, N.Dogan and A. Tansel, (2006), "Economic Performance and Unemployment: Evidence from an Emerging Economy, Turkey" *International Journal of Manpower*, 27 (7), 604-623.

Chowdhury A. R (1986), Monetary and Fiscal Impacts on Economic Activities in Bangladesh: A Note. *Bangladesh Development Studies*. Vol. XIV, No. 2, 101-106.

Dar-Atul, A. and Amirkhalkhali, S. (2002). Government Size, Factor Accumulation and Economic Growth: Evidence from OECD countries. *Journal of Policy Modeling*. 24(7&8): 679-692.

Enahoro, J., Jayeola, O. Onou, P. (2013). 'Operational Performance of Fiscal and Monetary Policies in Nigerian Financial Institutions.' *Asian Economic and Financial Review*, 31, 62-74.

Effiong, C., Igbeng, E., and Tapang, T. (2012). 'The Accounting Implications of Fiscal and Monetary Policies on the Development of the Nigerian Stock Market: 1992-2011.' *Journal of Economics and Sustainable Development*, 3(11): 83-98.

Ezigbo, C. (2012). 'Justification and Implication of Macroeconomic Management for Sustainable Development.' *Journal of Economics and Sustainable Development*, 3(11): 72-82.

Ewing B. T., W. Levernier and F. Malik (2003), "The Differential Effects of Output Shocks on Unemployment Rates by Race and Gender", *Southern Economic Journal*, 68(3), 584-599.

Friedman, M. (1954), The Quantity Theory of Money: A Restatement, in M Friedman (ed.), *Studies in the Quantity Theory of Money*. Chicago, University of Chicago Press.

Jawaid S.T., Arif, I. and Naeemullah, S. M. (2010), Comparative Analysis of Monetary and Fiscal Policy: A Case Study of Pakistan. *NICE Research Journal*, 3, 58-67.

Keynes J. M. (1936), The General Theory of Employment, Interest and Money, Macmillan Publishers.

Khosravi, A. and Karimi, M. S. (2010), To Investigate the Relationship between Monetary Policy, Fiscal Policy and Economic Growth in Iran: Autoregressive Distributed Lag Approach to Cointegration. *American Journal of Applied Sciences*, 7(3), 420 - 424.

Mansouri, B. (2008), Fiscal Policy and Economic Growth: Egypt, Morocco and Tunisia Compared. Proceeding in UNECA Conference on: Macroeconomic Policy, Productive Capacity and Economic Growth in Africa. Addis Ababa, 23-25 November, 2008.

Mahmood, T. and Sial, M. H. (2011). 'The Relative Effectiveness of Monetary and Fiscal Policies in Economic Growth: A Case Study of Pakistan.' *Asian Economic and Financial Review*, 1(4): 236-244.

Medee, P. N. and Nenbee, S.G. (2011), 'Econometric Analysis of the Impact of Fiscal Policy Variables on Nigeria's Economic Growth 1970-2009.' *International Journal of Economic Development Research and Investment*, 2(1): 171-183.

Miller, S.M. and Russek, F.S. (2003), The Relationship between Large Fiscal Adjustments and Short-Term Output Growth under Alternative Fiscal Policy Regimes. *Contemporary Economic Policy*, vol. 21, No. 1, January, pp. 41-58

Munongo, S. (2012). 'Effectiveness of Fiscal Policy in Economic Growth: The Case of Zimbabwe.'*International Journal of Economics Research*, 3(6): 93-99.

Njikamp, P. and Poot, J. (2002). Meta-analysis of the effect of Fiscal Policy on Long-Run Growth. *European Journal of Political Economy*, 20, 91-124.

Ogege, S. and Shiro, A. A. (2012). 'The Dynamics of Monetary and Fiscal Policy as a Tool for Economic Growth: Evidence from Nigeria.' *Journal of Management and Sustainability*, 2(2): 247-258.

Olawunmi, O. and Tajudeen, A. (2007), Fiscal Policy and Nigerian Economic Growth. *Journal of Research in National Development*, 5(2).

Omitogun, O and Ayinla, T.A. (2007), Fiscal Policy and Nigerian Economic Growth. *Journal of Research in National Development*. 5 (2) December.

Olaloye, A. O., and Ikhide, S. I. (1995), Economic Sustainability and the Role of Fiscal and Monetary Policies in a Depressed Economy: The Case Study of Nigeria. *Sustainable Development,* 3, 89-100.

Philip, A. (2009). 'Fiscal Policy within the New Consensus Macroeconomics Framework.' *Cambridge Centre for Economic and Public Policy (CCEPP) WP06-09*.

Philip, A. (2011). 'Fiscal Policy Is Still an Effective Instrument of Macroeconomic Policy.' *Panoeconomicus*, 58(2): 143-156.

Rakic B., Pesic, M., and Radjenovic, T. (2012), The Effects of Fiscal Policy in the Contemporary Economic Crisis Conditions. *Economics and Organization*s, 9(4), 393-405

Sanni, M. R., Amusa, N. A. and Agbeyangi, B.A. (2012). 'Potency of Monetary and Fiscal Policy Instruments on Economic Activities of Nigeria 1960-2011.' *Journal of African Macroeconomic Review*, 3(1): 161-176.

Shahid, A., Somia, I. and Asghar, A. (2008). 'Whether Fiscal Stance or Monetary Policy is Effective for Economic Growth in case of South Asian Countries?' *Pakistan Journal of Economics*, 4, 791-799.

Simorangkir, I. and Adamanti, J. (2010). 'The Role of Fiscal Stimuli and Monetary Easing in Indonesian Economy during Global Financial Crisis: Financial Computable General Equilibrium Approach.' *Paper Presented at EcoMod2010*, Istanbul.

Senbet, D. (2011), The Relative Impact of Fiscal versus Monetary Actions on Output: A Vector Autoregressive (VAR) Approach. *Business and Economic Journal*, 25, 1-11

Waranya, A. (2007), International Differences in the Relative Monetary-Fiscal Influence on Economic Stabilization. *Journal of International Economic Studies,* 21, 69-84.