The Impact of Fiscal Policy on the Nigerian Economy

Nathan Pelesai Audu
Department of Economics, Faculty of Social Sciences
Niger Delta University, Wilberforce Island
P.O. Box 33, Yenagoa, Bayelsa State, Nigeria
West Africa, Zip Code: 56001
E-mail: pelesai2002@yahoo.co.uk

Abstract
This research is aimed at evaluating the causal relationship between money supply, fiscal deficits and exports as a means of analysing the impact of policy on the growth of the Nigerian economy between 1970 and 2010. The research employed the Co-integration Error Correction Mechanism (ECM), a two band recursive least square to test for the stability of the Nigerian economy as well as determine the effect of money supply, fiscal deficits, and exports on the relative effectiveness of fiscal policies in the Nigerian economy. The study reveals that there is a significant causal relationship between gross domestic product (GDP) and the variables used in this research. We also conclude that there was a significant causal relationship between exports and gross domestic product and hence fiscal policies. Conclusively, on the whole, we recommend that fiscal policies have a significant influence on the output growth of the Nigeria economy.

Keywords: Economy, GDP, Effectiveness, Stability and Fiscal policy.

1. Introduction

The growth and development of the Nigerian economy has not been stable over the years as a result, the country's economy has witnesses so many shocks and disturbances both internally and externally over the decades. Internally, the unstable investment and consumption patterns as well as the improper implementation of public policies, changes in future expectations and the accelerator are some of the factors responsible for it. Similarly, the external factors identified are wars, revolutions, population growth rates and migration, technological transfer and changes as well as the openness of the country's Nigerian economy are some of the factors responsible.

The cyclical fluctuations in the country's economic activities has led to the periodical increase in the country's unemployment and inflation rates as well as the external sector disequilibria (Gbosi, 2001). In other words, fiscal policy is a major economic stabilisation weapon that involves measure taken to regulate and control the volume, cost and availability as well as direction of money in an economy to achieve some specified macroeconomic policy objective and to counteract undesirable trends in the Nigerian economy (Gbosi, 1998). Therefore, they cannot be left to the market forces of demand and supply as well as other instruments of stabilization such as monetary and exchange rate policies among others, are used to counteract are problems identified (Ndiyo and Udah 2003). This may include either an increase or a decrease in taxes as well as government expenditures which constitute the bedrock of fiscal policy but in reality, government policy requires a mixture of both fiscal and

monetary policy instruments to stabilize an economy because none of these single instruments can cure all the problems in an economy (Ndiyo and Udah, 2003).

The Nigeria economy started experiencing recession form early 1980s that leads to a depression in the mid 1980s. This depression continued until early 1990s without recovering from it. As such, the government continually initiated policy measures that would tackle and overcome the dwindling economy. Drawing the experience of the grate depression, government policy measure to curb the depression was in the form of increase government spending (Nagayasu, 2003). According to Okunroumu, (1993), the management of the Nigerian economy in order to achieve macroeconomic stability has been unproductive and negative hence one cannot say the Nigeria economy is performing. This is evidence in the adverse inflationary trend, government fiscal policies, undulating foreign exchange rates, the fall and rise of gross domestic product, unfavourable balance of payments as well as increasing unemployment rates are all symptoms of growing macroeconomic instability. As such, the Nigeria economy is unable to function well in an environment were there is low capacity utilization attributed to shortage in foreign exchange as well as the volatile and unpredictable government policies in Nigeria (Isaksson, 2001),

The aim of this paper, therefore, is to assess the impact of fiscal policy on the macroeconomic stabilization of the Nigeria economy. To facilitate our task, we divide this study into four sections. The next section presents the conceptual framework, while section 3 periscopes methodology and data analysis while section 4 concludes the study.

2. Conceptual Framework

Fiscal policy is undoubtedly one of the most important tolls used by government to achieve macroeconomic stability of the economy of most developing countries (Siyan and Adebayo, 2005). Therefore, the attempt to empirically test the efficacy of monetary and fiscal policy in an economy dates back to the pioneering studies of Friedman and Meiselman (1963) who empirically investigated the responsiveness of general price level on economic activity represented by aggregate consumption to change in money supply and autonomous government expenditure using ordinary simple linear regression model to estimate the US data from 1897-1957. In their conclusion, they found out that a stable and predictable casual relationship existed between demand and money supply while no such significant relationship was observed for government expenditure (Bogunjoko, 1997). Hence, there was a stable aggregate and money supply for the period.

According to Nwaobi (1997), in his article unit root of variables {Dickey-Fuller (DF) test and Augment Dickey-Fuller (ADF)} tests confirm that the model assumed the irrelevance of anticipated monetary policy for short-run deviations of domestic output from its natural level. Therefore, only the unanticipated components of external price changes in the level of external economic activity leads to the deviation of domestic output from natural and observed that monetary tightening once anticipated in an economy would have no effect on real domestic output in the short-run. Also, Anyanwu (1996) in his study of Nigeria's urban unemployment analyzed the monetary and fiscal policy implication Nigeria's full employment level. However, on the other hand, all the fiscal variables significantly reduced unemployment in Nigeria. This except one was highly significant in reducing the level of unemployment generation in Nigeria than monetary policy measure.

Also, Ajisafe folorunso (2001) in their study found out that monetary policy rather than fiscal policy exerts a great influence on economic activity in Nigeria. They therefore observed that the emphasis of government fiscal actions on the economy has led to a greater distortion of the Nigerian economy. Odedokun (1998) in his study also confirms that the growth of financial aggregates in real terms have positive impact on economic growth of development countries, irrespective of the level of economic development attained.

3. Analytical Methodology

In addition to the descriptive approach in the preceding section, the study now adopts an econometric approach in its empirical analysis of the relationship between fiscal policy, stability and economic growth of the Nigeria economy. The data used in this study are basically secondary data collected mainly from central Bank of Nigeria's statistically bulletin. The period of study spans between 1980 and 2010.

3.1 Specification of Empirical Model

In line with the neoclassical theoretical framework of fiscal policy that is rooted in the two gap model, the following empirical model is specified.

$GDP_t = f(MS_t, H_t, Ex_t)$ …………………………………………..(1)

Econometrically, equation (1) is transformed into an econometric log linear form thus:

$InGDP_t = b_0 + b_1 InH + B_2 InMS_{2t} + B_3 inEX_t + \varepsilon$………………………………………….(4)

Where: $InGDP_t$ = log of gross domestic product; $InMS_{2t}$ = log of broad money supply; InH_t= log of fiscal deficit; $InEX_t$=log of export. Therefore, the coefficients in the models $b_1 - b_3$ define elasticities of the logged variables.

$b_1 {>\atop<} 0, b_2 > 0, b_3 > 0$

This paper adopts an econometric technique that is rooted in co-integration while the method of estimation is the error correction model (ECM). The choice of error correction is informed by the fact that it is BLUE. The steps includes the testing of the series individually for stationarity using the Engle and Granger (1987) two step approach to determine the order of integration of the variables using the Augmented Dickey-Fuller (ADF) set of unit root test (Audu, 2010). After that we proceeded to search for the existence of long-run equilibrium casual relationship between fiscal policy and the macroeconomic variables affecting it as stated in the model.

3.2 Presentation and Analysis of Empirical Results

Table 1 below shows regression for the purpose of clarifying the result for the augmented-Dickey—Fuller test (ADF) class of unit root test. It was found that all the variables of the study exhibited unit root process at various critical levels but mostly at 5% level of significance. In other words, all the variables except log of broad money supply and ECM(-1) were found to be non-stationary at their levels but stationary at their first differences.

Tables 1: Unit root test on variables

Variables	Difference	Level of significant (%)	ADF statistic	Critical values	Lag
$InGDP_t$	1	5	-7.55	-2.98	2
H_t	1	5	-4.80	-3.72	2
$InMS_{2t}$	0	5	-3.27	-2.78	2
$InEx_t$	1	5	-4.40	-3.72	2
ECM(-1)	0	5	-5.50	-3.72	2

Source: Author's own computation

Cointegration analysis helps to clarify the long-run relationship between integrated variables. Johansen's procedure is the maximum likelihood for finite-order vector autoregressions (VARs) and is easily calculated for such systems, so it is used in this study. The Johansen's technique was chosen not only because it is VAR based but also due to the evidence that it

performs better than single equation and alternate multivariate methods. The results of the Cointegration test are presented in Table 2.

Table2: Johansen Hypothesized Cointegration Relations

Hypothesized			*Max-Eigen*	*5 Percent*	*1 Percent*	
No. of CE(s)	*Eigenvalue*		*Statistic*	*Critical Value*	*Critical Value*	
None **	0.991197		160.9114	33.46	38.77	
At most 1 **	0.954722		105.2275	27.07	32.24	
At most 2 **	0.892627		75.86919	20.97	25.52	
At most 3 **	0.569552		28.65957	14.07	18.63	
At most 4 **	0.256314		10.06864	3.76	6.65	
(**) denotes rejection of the hypothesis at the 5% and 1% levels						
Max-eigenvalue test indicates 5 cointegrating equation(s) at both 5% and 1% levels						

The ma-eigenvalue test shows that there are five cointegrating equations in the analysis. The PT-matrix of the beta coefficients from the Johansen cointegrating (CI) analysis and the preferred cointegrating equation of the model are presented in appendix 2. Only one cointegrating relation was chosen among the five, based on statistical significance and conformity of the coefficients with economic theory. As shown by the chosen CI equation, which normalized the coefficient of log of GDP_t, nearly all the explanatory variables are significant in influencing changes in fiscal policy except EX_t. The most significant of the determinants of fiscal policy are fiscal deficit and broad money supply. The non-significant of export in the long-run is not unexpected, based on the hypothesized low quality of the country's product in the international market. The relationship depicted by the CI equation shows that in the long-run fiscal deficits and broad money supply exerts positive influences on fiscal policy while exports affect fiscal policy negatively.

Having ascertained that the variables are non-stationary at their levels but stationary after differencing once, and that they are cointegrated, the stage is set to formulate an error correction model. The intuition behind the error correction model is the need to recover the long-run information lost by differencing the variables. The error correction model rectifies the problem by introducing an error correction term. The error correction term is derived from the long-run equation based on economic theory.

The error correction term enables us to gauge the speed of adjustment of fiscal policy to its long-run. It gives the proportion of the disequilibrium errors accumulated in the previous period which are corrected in the current period. The results show that the speed of adjustment of fiscal policy to long-run equilibrium path is very high. Specifically, about 64% of the disequilibrium errors, which occurred in the previous year, are corrected in the current year. It also show a very high performance of the economy (52%) thereby suggesting the existence of a strong influence.

Preceding the dynamic analysis, the results from the estimated static model shows that gross domestic product, broad money supply, fiscal deficit and exports are long-run determinants of fiscal policy in Nigeria. The result of the parsimonious ECM is presented in Table 3.

Table 3: Results from the Error Correction model Dependent Variable: In GDPT

Variable	Coefficient	Std. Error	t-Statistic	Prob.
InGDPT(-1)	0.524319	0.110918	4.727086	0.0001
InGDPT(-2)	0.556713	0.199483	2.790775	0.0095
C	283242.0	256740.9	1.103221	0.2797
InMST	9.212827	1.887818	4.880146	0.0000
InMST(-1)	-5.035694	1.370729	-3.673736	0.0010

InMST(-2)	2.121165	0.950605	2.231385	0.0342
InHT	13.23676	3.239232	4.086388	0.0004
InEXT(-1)	-2.023154	0.686200	-2.948344	0.0065
InEXT(-2)	-4.587401	1.037414	-4.421959	0.0001
ECM(-1)	-10.44700	3.320891	3.145842	0.0040

R-squared	0.877770	Mean dependent var	2115379.
Adjusted R-squared	0.837026	S.D. dependent var	2805645.
S.E. of regression	0.638113.	Akaike info criterion	30.94346
Sum squared resid	3.46E+13	Schwarz criterion	31.37884
Log likelihood	-562.4540	F-statistic	21.54385
Durbin-Watson stat	2.706762	Prob(F-statistic)	0.000000

Source: Authors' own computation

3.3 Major Empirical Finding

The over parameterized model from which the parsimonious ECM emanated is presented in appendix 1. The examination of the econometric models in Table 3 above shows that broad money supply, fiscal deficit, gross domestic products and exports variables explains 84% of the total variations in fiscal policies. This is indicated by the values of the adjusted R^2 (0.837). Given the F-values of 21.54, reveals that the overall regression is statistically significant while the Durbin–Watson statistics of 2.70 indicated the absence of serial autocorrelation. Also, the equation's standards error of 0.638 signifies that in about two-thirds of the time, the predicted value of GDP would be within 63.8% of the actual value. As shown in Table 3, all the variables have the expected signs and conform to economic theory as well as significant both at the 1% and 5% levels of significant.

The coefficient of the error correction term is statistically significant and carries the expected negative sign at both 5% and 1% level of significant. Hoverer, the speed of adjustment is fast, that is 1044.7% of the adjustment to equilibrium fiscal policy is expected to occur in the long-run. Further, this figure shows the average speed of adjustment of fiscal policy movement to its long-run change in the equilibrium conditions. This result indicate that ignoring error correction in non-stationary time series analysis would lead to misspecification of the underlying process to achieve real fiscal policy stability in the Nigerian economy. Conclusively, we submit that the result shows a casual relationship between fiscal policy and the selected macroeconomic variables identified as the determinants of fiscal policy, namely, broad money supply, fiscal deficit, gross domestic products and exports.

3.4 Stability Model of Fiscal Policy

The stability test enables us to predict the dependent variables in a regression with a reasonable level of precision given the independent variables used in the analysis. Therefore, we conduct the stability test using the method of the two band recursive residuals. This method shows a plot of recursive residuals about the zero line as well as the plus and minus two standard errors is shown at each stage. Also the residuals outside the standard error bands reveal instability in the parameters used in the equations. This is shown in Fig. 1 as the residual lie outside the standard error bands and thus reveals that the model exhibit a very high level of instability especially between 2002 and 2005. This period corresponds to the period of massive dereugulation of the economy. The plot of the CUSUM squares in fig. 2 tends to corroborate this view that the plot was on the 5% significance bound in 1990 and was actually outside the bound bound between 1991 and 2007.
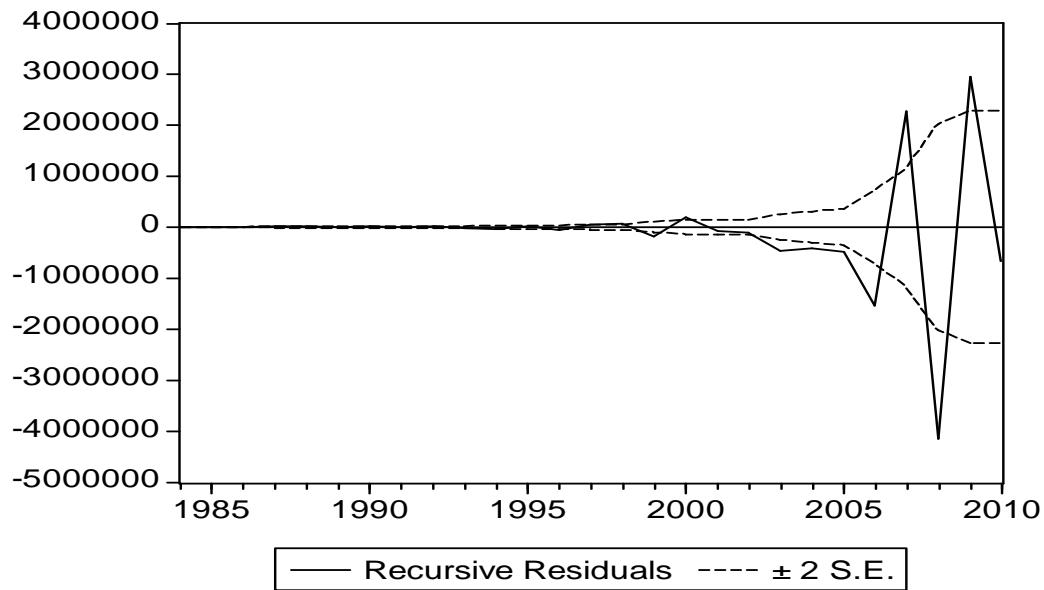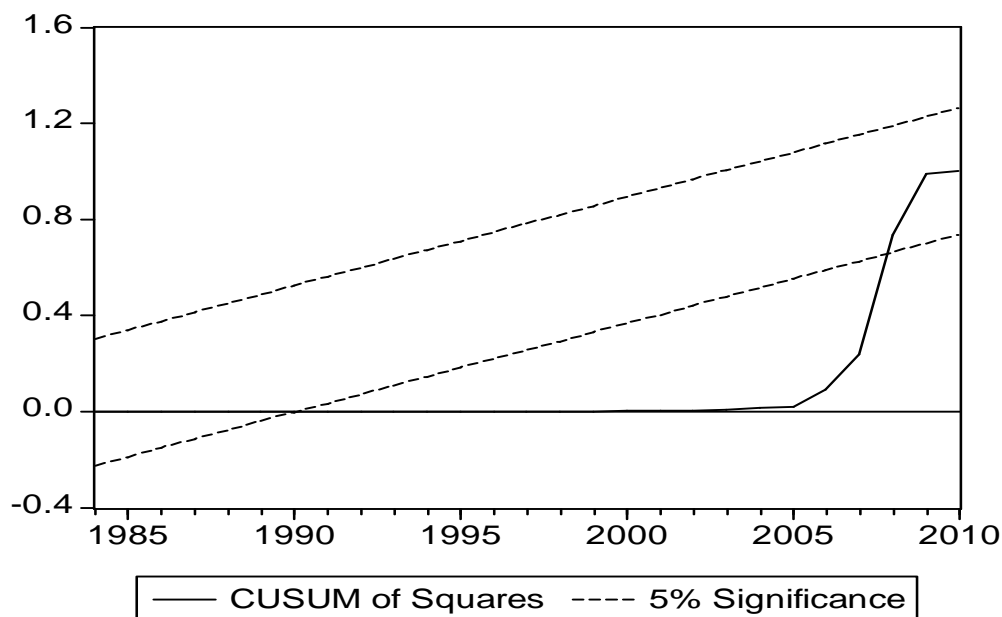
Fig.1: Stability test for fiscal policy in Nigeria

Fi

g. 2: Stability test for fiscal policy in Nigeria

3.5 Conclusion and Recommendation

The paper sets out to survey the effectiveness/determinants of fiscal policy in the Nigeria economy between 1980 and 2007. The model was estimated by the system of error correction Model (ECM) and the stability test was conducted using the method of recursive least square by putting the recursive residual about the zero line. According to Siyan et al (2004) and Audu (2008), the issue of the stability of fiscal policy is critical in assessing the monetary aggregates M1, M2, usefulness for the formulation of fiscal policy.

However, the econometric evidence obtained from the period of study revealed that all the variables were insignificant. This not withstanding, money supply and export variable do influence fiscal policy positively. Therefore, monetary authorities should focus on these variables in the choice of policy instruments in Nigeria. Similarly, the fiscal deficit variable does influence gross domestic negatively by – 0.2%. The evidence from out study shows the stability of the model and equally observed that the fiscal deficit variable was highly insignificant with a low value of -0.002 which indicate that the Nigeria economy does not depend on fiscal deficit budget.

We also submit that monetary manager, scholar and researchers, etc should design policy measures that are aimed encouraging the diversification of financial instruments through the development of a solid and sound money and capital market in Nigeria. We therefore conclude that a further research on his paper will increase our source of knowledge about the effectiveness of fiscal policy in the country.

Appendix 1

Over parameterised ECM of Fiscal Policy in Nigeria
Dependent Variable: GDPT
Method: Least Squares
Date: 05/22/11   Time: 12:09
Sample(adjusted): 1974 2010
Included observations: 37 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDPT(-1)	0.754026	0.225451	3.344525	0.0027
GDPT(-2)	0.573134	0.204706	2.799792	0.0099
C	158425.5	249910.4	0.633929	0.5321
MST	11.08781	1.985689	5.583861	0.0000
MST(-1)	-5.628136	1.320604	-4.261791	0.0003
MST(-2)	2.068882	0.895793	2.309553	0.0298
HT	9.808028	4.115479	2.383205	0.0254
HT(-1)	4.975550	5.288598	0.940807	0.3562
HT(-2)	2.015494	4.388754	0.459241	0.6502
EXT	-1.086534	0.876483	-1.239653	0.2271
EXT(-1)	-1.449138	0.724096	-2.001307	0.0568
EXT(-2)	-5.577991	1.042456	-5.350817	0.0000
ECM(-1)	8.365931	3.870565	2.161424	0.0409
R-squared	0.905728	Mean dependent var		2115379.
Adjusted R-squared	0.858592	S.D. dependent var		2805645.
S.E. of regression	1055043.	Akaike info criterion		30.84590
Sum squared resid	2.67E+13	Schwarz criterion		31.41190
Log likelihood	-557.6491	F-statistic		19.21517
Durbin-Watson stat	3.144739	Prob(F-statistic)		0.000000

Appendix 2

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):
PT-matrix of the beta coefficients from the Johansen cointegrating analysis

InGDPt	InMSt	InHt	InEXt	ECM(-1)
1.17E-06	1.14E-05	2.41E-05	-1.24E-05	2.19E-05

-2.35E-07	-2.06E-06	6.16E-06	2.72E-06	-5.57E-05
-1.54E-06	8.84E-06	2.89E-05	-8.79E-06	5.64E-06
-7.57E-07	-8.29E-06	-4.34E-06	9.33E-06	3.49E-05
1.65E-07	2.62E-06	-6.35E-06	-1.17E-06	5.06E-05

The first normalized cointegrating coefficients or equation (std.err. in parentheses)

InGDPt	InMSt	InHt	InEXt	ECM(-1)
1.000000	9.789712	20.69747	-10.60507	18.82701
	(0.28725)	(0.65841)	(0.30275)	(1.47990)

Appendix 3
Summary Statistics of Variables

Sample:1970 – 2010	GDPt	MSt	Ht	EXt
Mean	1909731.	1059259.	23846.64	1353140.
Median	271908.0	64902.70	647.7000	109886.1
Maximum	11411067	6730417.	264651.7	6587103.
Minimum	5201.100	547.9000	-53233.50	885.4000
Std. Dev.	2735955.	1950291.	70912.79	2162060.
Skewness	1.552804	1.991966	2.486530	1.489697
Kurtosis	4.971671	5.635294	7.806458	3.654144
Jarque-Bera	23.11766	38.97816	81.71533	15.89552
Probability	0.000010	0.000000	0.000000	0.000353
Sum	78298986	43429635	977712.1	55478741
Sum Sq. Dev.	2.99E+14	1.52E+14	2.01E+11	1.87E+14

List of variables

References

[1]   N.P. Audu, Finance, investment and economic growth in Nigeria: An error correction model, *Finance and Control Compendium (5th Edition)*, (2010a).

[2]   N.P. Audu and J.B. Ogbewo, Foreign direct investment, economic growth and export performance in Nigeria: An error correction model, *African Journal of Social Sciences*, 1(2) (2010), 53-63.

[3]   N.P. Audu, External debt management policies and economic growth in Nigeria, *Journal of Global Economy, Business and Finance*, 1(1) (2010b), 35-59.

[4]   N.P. Audu, Stability and the relative effectiveness of monetary policies in Nigeria, *LWATI*, V(IV) (2008), 144-157.

[5]   R.A. Ajisafe and B.A. Folorunso, The relative effectiveness of fiscal and monetary policy in macroeconomic management in Nigeria, *The Nigerian Economic and Financial Review*, 6(1) (2001), 147-161.

[6]   J.C. Anyanwu, Beyond SAP: A case of monetary sector, *Selected Paper of the 1996 Annual Conference of Nigerian Economic Society*, (1996), 369-390.

[7]   J.O. Bogunjoko, Monetary dimension of the Nigerian economic crisis: Empirical evidence from a co-integration paradigm, *Nigeria Journal of Economic and Social Studies*, 39(2) (1997), 145-167.

[8]   R.F. Engle and C.W.J. Granger, Co-integration and error correction representation, estimation and testing, *Econometric*, 55(2) (1987), 251-276.

[9]   M. Frieldman and E.M. Meiselman, *The Relative Stability of Monetary Velocity and Investment Multiplier in the US, Impacts of Monetary Policy Commission on Money and Credit*, (1987), Englewood cliffs and New Jersey: Prentice-Hill.

[10]   A.N. Gbosi, *Contemporary Macroeconomic Problems and Stabilization Policies in Nigeria*, (2001), Antovic Ventures, Port Harcourt.

[11]   A.N. Gbosi, *Banks, Financial Crisis and the Nigerian Economy Today*, (1998), Corporate Impression Publishers, Owerri.

[12]   A. Isaksson, Financial liberalization, foreign aid and capital mobility: Evidence from 90 developing countries, *Journal of International Financial Markets, Institutions and Money*, 11(2001), 309-338.

[13]   J. Nagayasu, The efficiency of the Japanese equity market, *IMF Working Paper*, No. 142 June, (2003).

[14]   G.C. Nwaobi, Money and output interaction in Nigeria: An econometric investigation using multivariate co-integration technique, *Central Bank of Nigerian Economic and Financial Review*, 37(3) (1997), 231-254.

[15]   N.A. Ndiyo and E.B. Udah, Dynamics of monetary policy and poverty in a small open economy: The Nigerian experience, *Nigerian Journal Economics and Development Matters*, 2(4) (2003), 40-68.

[16]   M.O. Odedokun, Financial intermediation and economic Growth in developing countries, *Journal of Economics Studies*, 25(3) (1998), 203-224.

[17]   T.O. Okunrounmu, Fiscal policies of the federal government strategies since 1986, *Central Bank of Nigeria, Economic and Financial Review*, 31(4) (1993), 340-350.

[18]   P. Siyan and F.O. Adebayo, An empirical investigation of stability and money demand in Nigeria (1970-1999), *Nigerian Journal of Economics Development Matters (NJEDM)*, 4(1) (2005), 87-102.