
DEFICIT FINANCING AND THE NIGERIAN ECONOMIC GROWTH

By

¹OYATAYO, Taiwo T.

²IVONGBE, Matthew I. (PhD)

¹Department of Banking and Finance, ²Department of Business Administration
Igbinedion University Okada, Edo State Nigeria

¹Email: taiwooyatayo@yahoo.co.uk, ²Email: matthew.egbochie@iuokada.edu.ng

¹Tel: +2348036648455. ²Tel: +2347038586809

ABSTRACT

This research study was conducted to find out the impact of deficit financing on Nigerian economic growth from 1988-2018. This study was necessitated by the fact that the economy is often said to be hindered for growing in terms of inadequate funding that will enable the policy makers to address critical infrastructures deficit. Therefore, this study employed the regression method, stationarity test and other diagnostic tests to investigate whether or not deficit financing has impact on Nigerian economy. The study made use of five explanatory variables which included real gross domestic product (RGDP), government revenue, government expenditure, money supply, exchange rate and Inflation to establish the impact explanatory variables have on these dependent variable (real gross domestic product). real gross domestic product serve as a dependent variables served as proxy for economic growth. The study revealed the following major findings: GR, government revenue have significant impact on economic growth. It is insignificant at 5% based on t-statistics. GE, government expenditure have significant impact on economic growth. It is not significant at 5% based on t-statistics. MS, money supply have significant impact in economic growth. It is not significant at 5% based on t-statistics. EXR, exchange rate have significant impact on economic growth. It is not significant at 5% based on t-statistics. INFR, Inflation have significant impact on economic growth. It is not significant at 5% based on t-statistics. It was obvious from the study that real gross domestic product (RGDP) and other variables are statistically significant to the economic growth of Nigeria. Therefore, this study recommends the following: Policy makers should intensify efforts toward prudent budget management which will provide more economic growth enablers; The government through the Central bank of Nigeria and Federal Ministry of Finance and National Planning should formulate and implement more institutional strengthening policies in the areas of effective allocation of the much needed resources to the real sector of the economy; There is need to also improve on the economic fundamentals that will enable the economic players to operate with hindrance to growth and development.

Keywords: Budget, Budgeting, Vudget Surokus, Budget Deficit, Economy, Economic Growth, Economic Development, Interest Rate, Inflation, Expenditure

SECTION ONE

BACKGROUND OF THE STUDY

A government deficit financing is when the government spends more than its revenue. This usually occurs during the fiscal year. From the colonial era until during Shehu Shagari Presidency (1979-83), the fiscal year was 1st April to 31st March. It was then changed to 1st January to 31st December. The Government budget can be considered balanced when planned expenditure equal planned revenue but When planned revenue is more than planned expenditure it is considered surplus. It is deficit when planned revenue is less than planned expenditure. When it is surplus, the surplus is held as revenue reserve. When it is deficit the government has to source for other ways of raising funds to make up the deficit. Deficit financing seems to present a negative impact on investment on developing economies especially Nigeria. When there is a budget deficit, government finds ways of financing the deficit through borrowing from commercial banks or from non-banking public and through the issue of short term bonds and monetary instrument. The use of these forms of deficit financing for the pursuit of fiscal policies often leads to crowding out of private investment, inflation as well as future debt crisis.

STATEMENT OF RESEARCH PROBLEM

The relationship between deficits financing and macroeconomic variables such as GDP, Money Supply, Exchange Rate and Inflation stands to represents the most widely discussed economic issues among macroeconomists. They argue that deficit financing may be absolutely necessary especially in times of economic downturn. Some macroeconomists are in the agreement that; deficit financing is capable of creating major economic problems for any country and its government

OBJECTIVES OF THE STUDY

The major objective of this study is to empirically study the impact of public debt management on the economic growth of Nigeria. Specifically to:

- i. Determine the overall effect Government Revenue has on economic growth of Nigeria.
- ii. Determine whether Government Expenditure influences economic growth in Nigeria.
- iii. Determine whether Money Supply influences economic growth in Nigeria
- iv. Determine whether exchange rate influences economic growth in Nigeria.
- v. Determine whether Inflation Rate influences economic growth in Nigeria.
- vi. Determine whether Unemployment Rate influences economic growth in Nigeria.

RESEARCH QUESTIONS

- i. To what extent has Government Revenue influenced economic growth in Nigeria?
- ii. To what extent does Government Expenditure influence economic growth in Nigeria?
- iii. To what extent does Money Supply influence economic growth in Nigeria?
- iv. To what extent does Exchange rate influence economic growth in Nigeria?
- v. To what extent does Inflation rate influence economic growth in Nigeria?
- vi. To what extent does Unemployment rate influence economic growth in Nigeria?

STATEMENT OF HYPOTHESES

1. H_0 : There is no significant relationship between Government Revenue and economic growth in Nigeria

- H₁: There is no significant relationship between Government Expenditure and economic growth in Nigeria.
2. H₀: There is no significant relationship between Money Supply and economic growth in Nigeria.
H₁: There is no significant relationship between exchange rate and economic growth in Nigeria.
3. H₀: There is no significant relationship between Inflation rate and economic growth in Nigeria.
H₁: There is no significant relationship between Unemployment rate and economic growth in Nigeria.

SCOPE AND LIMITATION OF THE STUDY

This study only concentrates on Federal Government Deficit financing limited to the period of thirty (30) years that is from 1988 to 2018. The period is suitable for this research because, statistically, sample size of 30 years is adjudged to be a large sample.

SECTION TWO

LITERATURE REVIEW

CONCEPTUAL REVIEW

Deficit financing can be seen as a budgetary situation whereby the expenditure of the government exceeds its revenue, accumulated through tax. This budgetary system is undertaken by many developing countries of the world as a means of achieving some macro-economics objectives. In conventional settings, deficit financing is seen as a policy strategy which is mostly undertaken to address macro-economic quagmires like depression and low output. On the other hand, deficit financing still appears to be a strategy that has the tendency of mounting pressure on prices thereby causing inflation.

EMPERICAL REVIEW

Dalyop (2010) did his study to determine the effects of fiscal deficits and the growth of domestic output in Nigeria. His study is preceeded by extensive review of literature. For example, he referred to Akor (2001) who observed that government expenditures grew large as bureaucracy grew. But when there was glut in the crude oil market, revenues declined “but government was reluctant in reducing the bloated expenditures that had resulted during the oil boom. Government then resorted to fiscal deficits as to continue its deficit spending. Dalyop (2010) further explains that, fiscal deficits occur when government expenditures exceed revenues and “have become a recurring feature of public sector financing in Nigeria”. However, Keynesian demand side economics justifies deficit financing by governments to reflate and economy that is in a recession or depression.

Olusoji and Oderinde (2011) in their study of fiscal deficit and inflation Trend in Nigeria, like Onwioduokit wanted to find out whether deficit spending cause inflation or is it inflation that cause deficit spending. They used what they called more robust Toda- Yamama to Granger non-causality test. Their study did not establish any “clear evidence of causality relationship between fiscal deficit and inflation in Nigeria for the period of study 1970-2006. Their finding is somewhat close to the finding of Onwiodnokit. The finding indicate a causality link between deficit spending and inflation but not from inflation to deficit spending.

Obi and Nurudeen (2009) did a study to establish if fiscal deficits raise interest rate in Nigeria. They used Vector Auto Regression (VAR) to carry out their analysis. Their results indicate that fiscal deficits and government debt have positive impact on interest rates. They opined that “deficits financing leads to huge debt stock and tends to crowd-out private sector investment” and raise interest rates. The outcome is fall in productivity and GDP.

Ezeabasili and Mojekwu (2011) carried out a study of fiscal deficits and interest rates in Nigeria. They used co-integration techniques and structural analysis for the study. The results are that fiscal deficits and interest rates are positive and statistically significant. The indications are that large deficits cause high interest rates. Also Money Supply has an inverse relationship with interests in Nigeria and there exists a positive and significant relationship between inflation and interest rates.

This study adopts the work of Ezeabbasili and Mojekwu (2011) in determining the impact of deficit financing on the Nigeria economic growth.

SECTION THREE

PRESENTATION AND DISCUSSIONS

Research Design

The research approach used in this study is longitudinal.

Nature of the Data

The research study was on the use of secondary data.

Sources of the Data Collection.

The secondary data shall be collected from different sources e.g. Debt Management Office (DMO), National Bureau of Statistics (NBS) and Central Bank of Nigeria (CBN) annual Statistical Bulletins.

Technique of Data Analysis.

The technique of analysis was both content and statistical. With regard to content, it exposed the available information on purely descriptive, comparative and analytical grounds. Analysis was based on the trend of the economy during the period under review which is 1988 – 2018. Specifically, data was analyzed, summarized and compared to know the performance of the policy measures in the areas of reduction of inflation, growth in gross domestic product, reduction of unemployment, growth in real sector, improvement of balance of payment and increasing non-oil exports from 1988 – 2018. In the usage of econometrics/statistics, emphasis was on testing the hypotheses. Models were specified and ordinary least square (OLS) regression used to test relationship between the dependent variables (gross domestic product, unemployment and inflation) and independent variables (government expenditure, tax receipts, foreign exchange rates, gross domestic product, money supply, inflation rate, unemployment rate). Some criteria such as coefficient determination (R^2), T –test, f-test, and Durbin Watson (DW) statistics were used. Durbin Watson statistics was used to be able to examine the extent of serial correlation among the variable.

Specification of Model

Three models were specified to tackle the hypotheses and also three models were built to ascertain the effect of each independent variable on gross domestic product; inflation; and unemployment.

Model 1

$$\text{GDP} = F(X_1, X_2, X_3, X_4) + U_t$$

Where:

GDP = Gross Domestic Product (Y)

X1 = Government Expenditure

X2 = Government revenue

X3 = Money supply

X4 = Foreign Exchange rate

U_t = Stochastic (error) variable

Where GDP is the dependent variable and X₁- X₄ are independent variables which influence growth (dependent variable); explicitly

$$= b_1 X_1, b_2 X_2, b_3 X_3, b_4 X_4 + U_t$$

Model 2

$$\text{INF} = F(X_1, X_2, X_3, X_4) + U_t$$

where

INF = inflation.

X1 = government Expenditure

X2 = government Revenue

X3 = Money supply

X4 = Foreign Exchange rate

X5 = unemployment

U_t = stochastic (error) variable.

Where INF is the dependent variable and X₁ - X₄ are independent variables which influence growth (dependent); explicitly - b₁ X₁, b₂ X₂, b₃ X₃, b₄ X₄ + U_t.

Model 3

$$\text{UEMP} = F(X_1, X_2, X_3, X_4) + U_t$$

Where:

UEMP = unemployment rate (Y)

X1 = government Expenditure

X2 = Government Revenue

X3 = Money supply

X4 = Foreign Exchange rate

U_t = stochastic (error) variable.

Where UEMP is the dependent variable and X₁-X₄ are independent variables which influence growth (dependent); explicitly- b₁ X₁, b₂ X₂, b₃ X₃, b₄ X₄ + U_t.

Justification of Methods

The use of the OLS technique to estimate the specified models is based on four reasons. First, the parameter estimates of OLS have some optimal (desirable) properties called BLUE properties. Secondly, the computational procedure of OLS is fairly simple as compared with other econometric techniques. Thirdly, the least squares method has been used in a wide range of economic relationship. Lastly, the mechanisms of OLS are simple to understand. To avoid the issue of spurious regression results, the ADF unit root test of stationarity needs to be performed. Cointegration also takes care of spurious regression problems by permitting us to find out whether there is a long-run relationship between the time series variables in the specified models and possibility of these correcting errors through vector error correction mechanism (VECM).

Data Presentation

The results of the stationarity test using ADF for all the time series data in table 2 shows that the null hypothesis (H₀) of a unit root can be rejected at 1(1) differences because all the series (RGDP, MS, GR, GE, EXR, INF and UNEM) are stationary and therefore their regression will not be spurious. The series are all stationary at a critical value of 5% level of significance. The stationarity is obtained by comparing test statistics with critical values, if the t-calculated is greater than the critical values numerically, the variable is stationary and if it is the reverse, it is not stationary. The table 2 shows the entire ADF statistics calculated greater than critical values that is why they are stationary. Hence the data are adequate enough for further treatment and analysis since they are have found to be stationary.

The estimated coefficient value of ECM (-3.823506) has a priori (negative) sign. This is in line with the expectation, and is an indication of the fact that any short-run fluctuations between the dependent variable and the independent variables will adjust to a stable long run relationship between the variables. The negative sign of -3.823506 also means that the speed of adjustment is -3.82% to adjust to its equilibrium state.

- (i) It was found that coefficient of exchange (GE) is positive (0.192639), indicating positive relationship between government expenditure and gross domestic product in Nigeria during the period of 1988-2018, and this is in line with a priori expectation when government expenditure increases. GDP increases as well. The government expenditure is statistically significant since its t-stat (7.14801) is less than its critical value (2.07) at 5% level of significance. Thus, we accept the null hypothesis (H₀) and conclude that government expenditure (GE) has positively and significant impact on gross domestic product in Nigeria during the period under study since value t-ratio calculated 7.14801 is greater than theoretical t-ratio value of 2.07. This finding agrees with Ogbolo, Sunny and Isaac (2011) who revealed that there is a positive relationship between government expenditure and economic growth in Nigeria.
- (ii) The coefficient of government revenue is positively sign indicating positive relationship between government revenue (GR) and gross domestic product (GDP) in Nigeria during the 1988-2018, and this is in line with a priori expectation. The government revenue is statistically significant since its t-stat (-4.00956) is greater than its critical value (2.07) at 5% level of significance. Thus, we accept the alternative hypothesis (H₁) and conclude that government revenue (GR) has positively and significant impact on gross domestic product in Nigeria during the period under study.
- (iii) The coefficient of money supply (MS) is negative, indicating negative relationship between money supply and gross domestic product (GDP) in Nigeria during the 1988-2018, and this is in line with a priori expectation. The money supply is statistically significant since its t-stat (-12.4264) is greater than its critical value (2.07) at 5% level of significance. Thus, we accept the alternative hypothesis (H₁) and conclude that money supply (MS) has significant impact on gross domestic product in Nigeria 1988-2018.
- (iv) Exchange rate (EXR) has negative coefficient, indicating negative relationship between exchange rate and gross domestic product (GDP) in Nigeria during the 1988-2018, and this is in line with a priori expectation. This finding agrees with Iyoha, Adamu & Ighodaro (2012) who found that exchange rate has negative impact on economic growth in countries of West Africa Monetary zone. Exchange rate is

significant as its t-stat (-4.58506) is less than its critical value (2.07) at 5% level of significance.

The estimated coefficient value of ECM (-6.007336) has a priori expectation (negative) sign. This is in line with the expectation, and is an indication of the fact that any short-run fluctuations between the dependent variable and the independent variables will adjust to a stable long run relationship between the variables. The negative sign of (-6.007336) also means that 6.01% of the discrepancies between short run and long run equilibrium will be adjusted within a year.

- (i) It was found that coefficient of government expenditure (GE) is positive (2.486336), indicating positive relationship between government expenditure and inflation rate in Nigeria during the period of 1988-2018, and this is in line with a priori expectation when government expenditure increases, inflation rate increases as well. The government expenditure is statistically significant since its t-stat (5.67542) is less than its critical value (2.07) at 5% level of significance. Thus, we accept the alternative hypothesis (H_1) and conclude that government expenditure (GE) has positive and significant impact on inflation rate in Nigeria during the period under study since value t-ratio calculated 5.67542 is greater than theoretical t-ratio value of 2.07.
- (ii) The coefficient of government revenue is negatively sign indicating negative relationship between government revenue (GR) and inflation rate (INFR) in Nigeria during the 1988-2018, and this is in line with a priori expectation. The government revenue is statistically significant since its t-stat (-2.89836) is greater than its critical value (2.07) at 5% level of significance. Thus, we accept the alternative hypothesis (H_1) and conclude that government revenue (GR) has negatively and significant impact on inflation rate in Nigeria during the period under study.
- (iii) The coefficient of money supply (MS) is negative, indicating negative relationship between money supply and inflation rate (INFR) in Nigeria during the 1988-2018, and this is in line with a priori expectation. The money supply is statistically significant since its t-stat (-8.51616) is greater than its critical value (2.07) at 5% level of significance. Thus, we accept the alternative hypothesis (H_1) and conclude that money supply (MS) has significant impact on inflation rate in Nigeria 1988-2018.
- (iv) Exchange rate (EXR) has negative coefficient, indicating negative relationship between exchange rate and inflation rate (INFR) in Nigeria during the 1988-2018, and this is in line with a priori expectation. Exchange rate is not significant as its t-stat (-1.57291) is less than its critical value (2.07) at 5% level of significance.

The estimated coefficient value of ECM (-1.105048) has a priori expectation (negative) sign. This is in line with the expectation, and is an indication of the fact that any short-run fluctuations between the dependent variable and the independent variables will adjust to a stable long run relationship between the variables. The negative sign of (-1.105048) also means that 1.11% of the discrepancies between short run and long run equilibrium will be adjusted within a year.

- (i) It was found that coefficient of government revenue (GR) is negative (-6.62549), indicating positive relationship between government revenue and employment rate in Nigeria during the period of 1988-2018, and this is in line with a priori expectation when government expenditure increases, employment rate increases as well. The government revenue is statistically significant since its t-stat (-6.62549) is greater than its critical value (2.07) at 5% level of significance. Thus, we accept the

alternative hypothesis (H₁) and conclude that government revenue (GR) has positively and significant impact on employment rate in Nigeria during the period under study since value t-ratio calculated -6.62549 is greater than theoretical t-ratio value of 2.07.

- (ii) The coefficient of government revenue is negatively sign indicating negative relationship between government revenue (GR) and inflation rate (INFR) in Nigeria during the 1988-2018, and this is in line with a priori expectation. The government revenue is statistically significant since its t-stat (-2.89836) is greater than its critical value (2.07) at 5% level of significance. Thus, we accept the alternative hypothesis (H₁) and conclude that government revenue (GR) has negatively and significant impact on inflation rate in Nigeria during the period under study.
- (iii) The coefficient of money supply (MS) is negative, indicating negative relationship between money supply and employment rate (ER) in Nigeria during the 1988-2018, and this is in line with a priori expectation. The money supply is statistically significant since its t-stat [-9.95759] is greater than its critical value (2.07) at 5% level of significance. Thus, we accept the alternative hypothesis (H₁) and conclude that money supply (MS) has significant impact on employment rate in Nigeria 1988-2018.
- (iv) Exchange rate (EXR) has negative coefficient, indicating negative relationship between exchange rate and employment rate (ER) in Nigeria during the 1988-2018, and this is in line with a priori expectation. Exchange rate is significant as its t-stat [-6.12458] is less than its critical value (2.07) at 5% level of significance.

CONCLUSION AND RECOMMENDATIONS

This study employed regression to examine the deficit financing on Nigerian economic growth from 1988 to 2018. The study made use of five explanatory variables which included real gross domestic product (RGDP), government revenue, government expenditure, money supply, exchange rate and Inflation to establish the impact explanatory variables have on these dependent variable (real gross domestic product). Real gross domestic product serve as a dependent variable served as proxy for economic growth.

The study revealed the following major findings:

GR, government revenue has significant impact on economic growth. It is insignificant at 5% based on t-statistics.

GE, government expenditure has significant impact on economic growth. It is not significant at 5% based on t-statistics.

MS, money supply has significant impact in economic growth. It is not significant at 5% based on t-statistics.

EXR, exchange rate has significant impact on economic growth. It is not significant at 5% based on t-statistics.

INFR, Inflation has significant impact on economic growth. It is not significant at 5% based on t-statistics.

CONCLUSION

This study was conducted to find out the impact of deficit financing on Nigerian economic growth. This study was necessitated by the fact that the economy is often said to be hindered for growing in terms of inadequate funding that will enable the policy makers to address critical infrastructures deficit. Therefore, this study employed the regression method, stationarity test and other diagnostic tests to investigate whether or not deficit financing has impact on Nigerian economy.

RECOMMENDATIONS

It was obvious from the study that real gross domestic product (RGDP), government revenue, government expenditure, money supply, exchange rate and Inflation are statistically significant in Nigerian economic growth individually as well as collectively. Therefore, this study recommends the following: Policy makers should intensify efforts toward prudent budget management provide the economic growth enablers; The government through the Central bank of Nigeria and Federal Ministry of Finance and National Planning should formulate and implement institutional strengthening policies in the areas of effective allocation of the much needed resources to the real sector of the economy; There is need to also improve on the economic fundamentals that will enable the economic players to operate with hindrance to growth and development.

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APPENDIX 1 – LIST OF FIGURES

Figure 1: A line chart showing distribution of Economic Performance in terms of Real Gross Domestic Product (RGDP) from 1988 to 2018

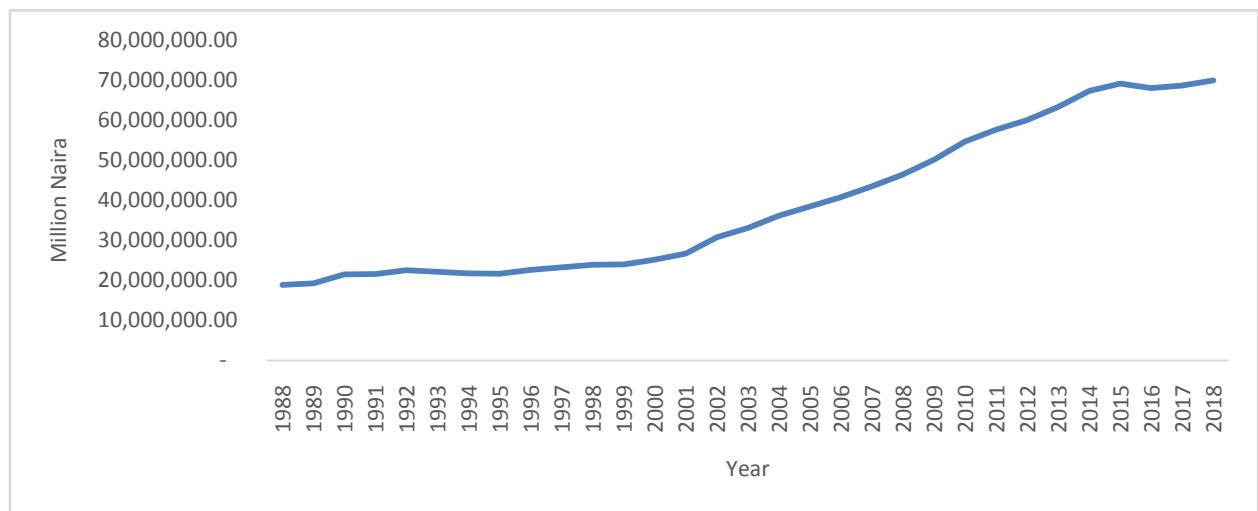


Figure 2: A Line chart showing distribution of Money supply into Circulation in Nigeria from 1988 to 2018

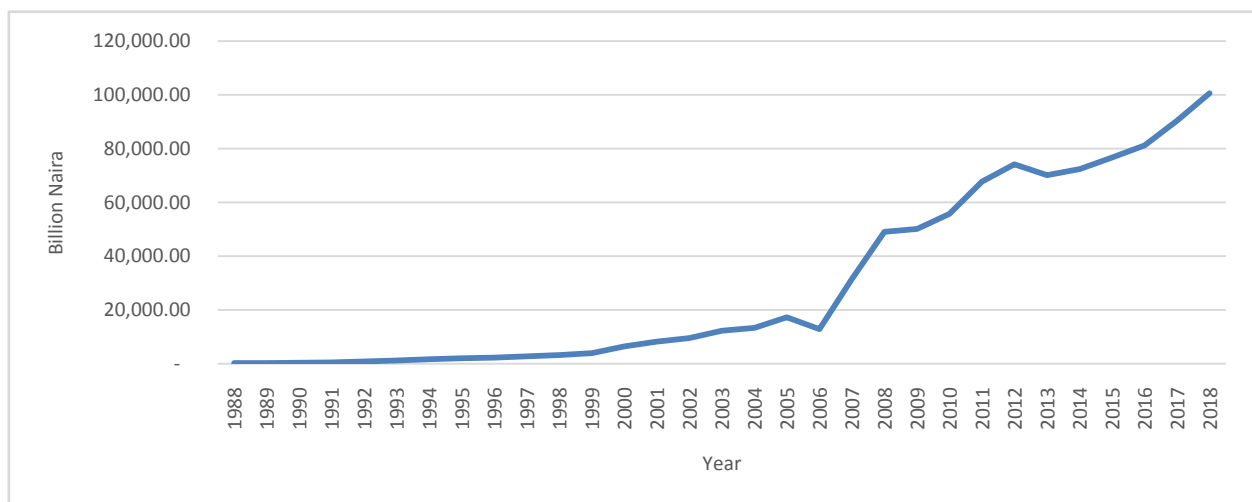


Figure 3: A Line chart showing distribution of Revenue and Government expenditure from 1988 to 2018

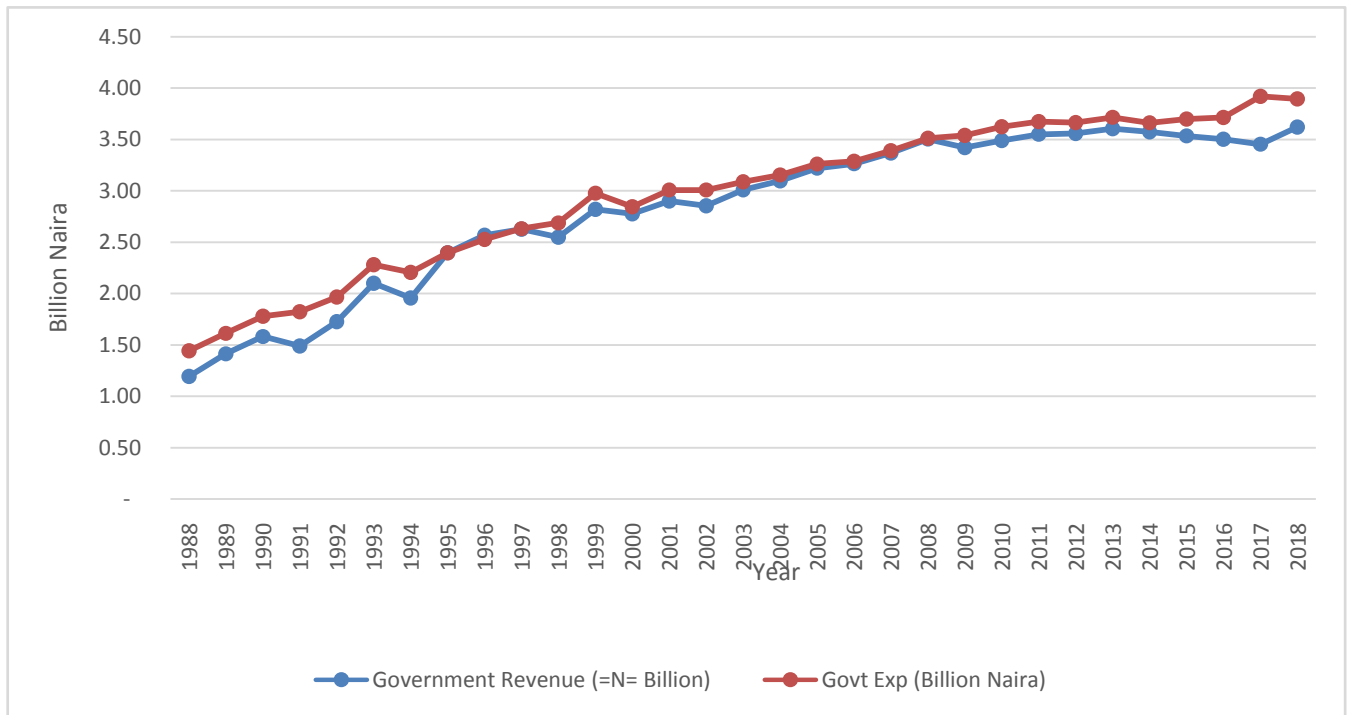


Figure 4: A Line showing distribution of US dollar to a Naira

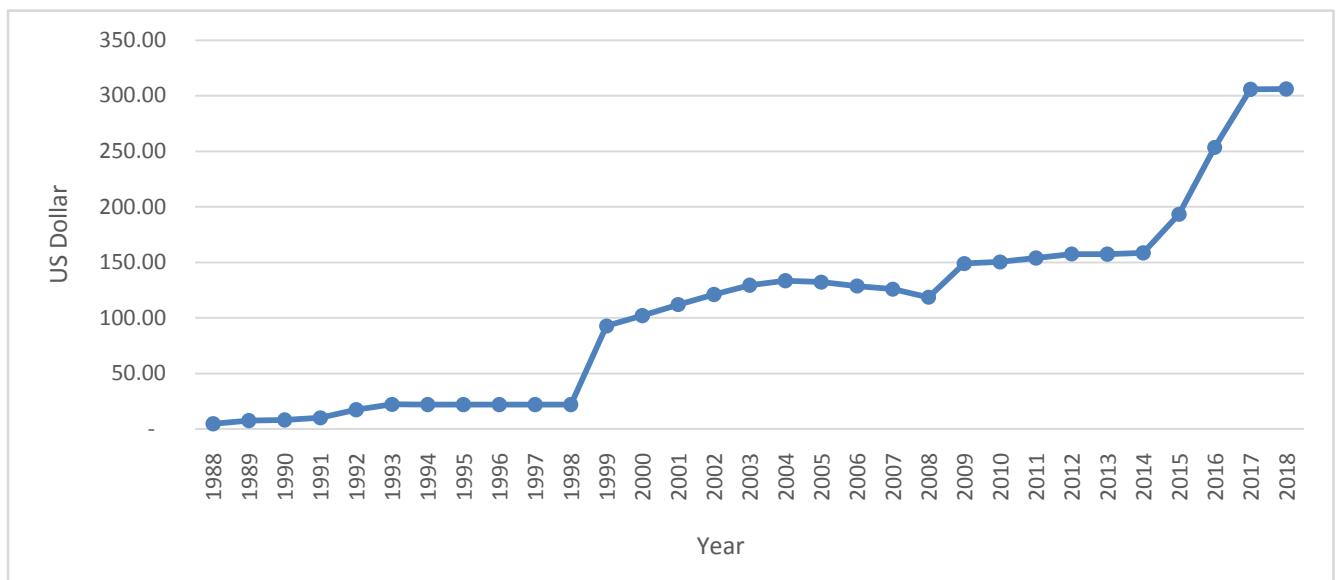
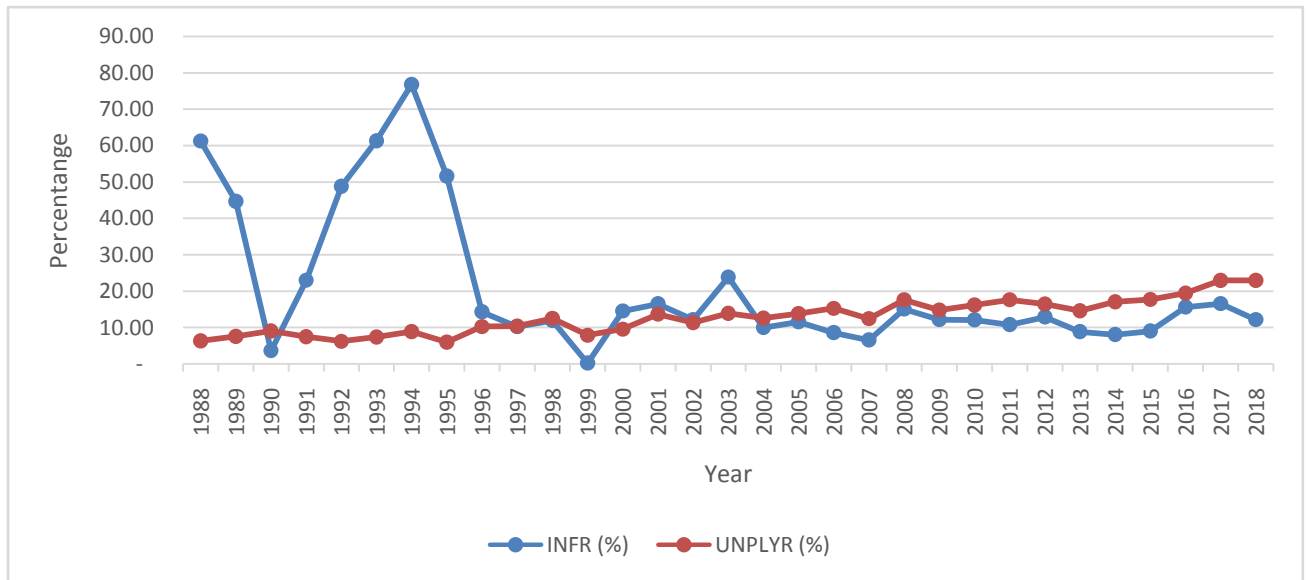


Figure 5: A Line chart showing distribution of Misery rate of the nation (Inflation and Unemployment rate (%))



APPENDIX 2 –LIST OF TABLES

Table 1: Summary of the description of variables and their corresponding unit and sources

VARIABLE	DESCRIPTION	UNIT	SOURCE
RGDP	Real Gross Domestic Product	Millions of Naira	NBS
MS	Money Supply	Millions of Naira	CBN
GR	Government Revenue	Millions of Naira	FMF
GE	Government Expenditure	Millions of Naira	FMF
EXR	Exchange rate	US Dollar	CBN
INF	Inflation rate	Percentage	NBS
UNEM	Unemployment Rate	Percentage	NBS

Source: Researcher's own computation

Table 2: Augmented Dickey-Fuller (ADF) Unit Root Test

Series	ADF Test Statistics	5% Critical Value	Order of Cointegration
RGDP	-3.487556	-2.967767	I(1)
MS	-5.143963	-2.967767	1(1)
GR	-6.827181	-2.967767	I(1)
GE	-7.909833	-2.967767	1(1)
EXR	-3.880870	-2.967767	1(1)
INF	-4.428033	-2.967767	1(1)
UNEM	-9.027666	-2.967767	1(1)

Note: * denotes that the variable not stationary at that percent
 Source: Author's computation, 2019 using E-views 10.0

Table 3: Johansen Cointegration Test

Date: 02/26/20 Time: 17:50
 Sample (adjusted): 1990 2018
 Included observations: 29 after adjustments
 Trend assumption: Linear deterministic trend
 Series: RGDP GE GR MS EXR INF UNEM
 Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized	Trace	0.05		
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.776338	145.9728	125.6154	0.0016
At most 1 *	0.686162	102.5418	95.75366	0.0157
At most 2	0.600578	68.93434	69.81889	0.0587
At most 3	0.531290	42.31996	47.85613	0.1500
At most 4	0.389103	20.34457	29.79707	0.3997
At most 5	0.188366	6.052603	15.49471	0.6893
At most 6	4.43E-06	0.000128	3.841466	0.9924

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

The results on table 3 above showed that the Eigen value is less than 5% critical value (at all levels). It can also be observed that there are two unique co-integration equations between Inflation rate, unemployment rate and real gross domestic product (GDP) in Nigeria during the period, 1988-2018 as shown in the table above. Since there is at least two cointegrating equation found in the model, the study concludes that significant long-run relationship exists among the variables. Also, since all the variables were found to be stationary and cointegrated, the study can now perform vector error correction model (VECM) test.

Model 1: Error Correction Model (VECM)

Vector Error Correction Estimates

Date: 03/22/20 Time: 13:29

Sample (adjusted): 1991 2018

Included observations: 28 after adjustments

Standard errors in () & t-statistics in []

Cointegrating Eq:	CointEq1					
GDP(-1)	1.000000					
GE(-1)	1.287562 (0.18013) [7.14801]					
GR(-1)	0.435941 (0.10873) [4.00956]					
MS(-1)	-0.796454 (0.06409) [-12.4264]					
EXCHR(-1)	-0.001348 (0.00029) [-4.58506]					
C	-3.823506					
Error Correction:	D(GDP)	D(GE)	D(GR)	D(MS)	D(EXCHR)	
CointEq1	-0.162827 (0.06624) [-2.45822]	-0.674927 (0.43021) [-1.56883]	-0.822699 (0.62810) [-1.30982]	0.383265 (0.48625) [0.78821]	92.34813 (97.9840) [0.94248]	
D(GDP(-1))	0.060575 (0.18940) [0.31983]	-2.214036 (1.23015) [-1.79982]	-2.975982 (1.79599) [-1.65702]	-0.404137 (1.39037) [-0.29067]	-43.00134 (280.176) [-0.15348]	
D(GDP(-2))	0.460929 (0.18126) [2.54288]	0.222648 (1.17729) [0.18912]	-0.130614 (1.71883) [-0.07599]	0.354984 (1.33064) [0.26678]	-210.8502 (268.138) [-0.78635]	

D(GE(-1))	0.177692 (0.08037) [2.21079]	0.192639 (0.52203) [0.36902]	0.779691 (0.76215) [1.02301]	-0.077877 (0.59002) [-0.13199]	-136.7900 (118.897) [-1.15049]
D(GE(-2))	0.049424 (0.07089) [0.69716]	0.710691 (0.46044) [1.54349]	1.367732 (0.67224) [2.03459]	0.608574 (0.52042) [1.16940]	-61.67433 (104.870) [-0.58810]
D(GR(-1))	-0.095916 (0.04470) [-2.14565]	-0.346881 (0.29034) [-1.19473]	-0.753584 (0.42389) [-1.77776]	0.207029 (0.32816) [0.63088]	-6.608388 (66.1280) [-0.09993]
D(GR(-2))	-0.046101 (0.04792) [-0.96206]	-0.594234 (0.31123) [-1.90929]	-1.083638 (0.45439) [-2.38480]	-0.237751 (0.35177) [-0.67587]	-7.743910 (70.8860) [-0.10924]
D(MS(-1))	-0.080398 (0.04721) [-1.70301]	-0.116992 (0.30662) [-0.38155]	-0.193141 (0.44766) [-0.43144]	0.032154 (0.34656) [0.09278]	56.70630 (69.8357) [0.81200]
D(MS(-2))	-0.059237 (0.03840) [-1.54278]	-0.153855 (0.24938) [-0.61695]	-0.169627 (0.36409) [-0.46589]	0.027456 (0.28186) [0.09741]	51.48962 (56.7987) [0.90653]
D(EXCHR(-1))	-0.000456 (0.00020) [-2.30584]	-0.001350 (0.00128) [-1.05043]	-0.002641 (0.00188) [-1.40765]	-0.000264 (0.00145) [-0.18160]	0.313463 (0.29265) [1.07111]
D(EXCHR(-2))	8.32E-05 (0.00019) [0.44232]	-0.001173 (0.00122) [-0.96046]	-0.001423 (0.00178) [-0.79782]	-0.000587 (0.00138) [-0.42502]	-0.210422 (0.27827) [-0.75618]
C	0.017889 (0.00948) [1.88712]	0.164361 (0.06157) [2.66952]	0.177033 (0.08989) [1.96944]	0.050623 (0.06959) [0.72745]	22.09377 (14.0230) [1.57554]
R-squared	0.578711	0.483330	0.437373	0.243456	0.338087
Adj. R-squared	0.289076	0.128120	0.050568	-0.276668	-0.116978
Sum sq. resids	0.003286	0.138621	0.295475	0.177083	7190.782
S.E. equation	0.014331	0.093079	0.135894	0.105203	21.19962
F-statistic	1.998066	1.360688	1.130731	0.468073	0.742943
Log likelihood	86.97355	34.58479	23.98896	31.15653	-117.4072
Akaike AIC	-5.355253	-1.613199	-0.856354	-1.368323	9.243371
Schwarz SC	-4.784309	-1.042254	-0.285410	-0.797378	9.814315
Mean dependent	0.020000	0.075357	0.072857	0.086071	10.64679
S.D. dependent	0.016997	0.099684	0.139466	0.093108	20.05884

Determinant resid covariance (dof
 adj.) 1.11E-08
 Determinant resid covariance 6.77E-10

Log likelihood	96.93494
Akaike information criterion	-2.281067
Schwarz criterion	0.811550

Model 2: Error Correction Model (VECM)

Vector Error Correction Estimates
 Date: 03/22/20 Time: 13:34
 Sample (adjusted): 1991 2018
 Included observations: 28 after adjustments
 Standard errors in () & t-statistics in []

Cointegrating Eq:	CointEq1
INFR(-1)	1.000000
GE(-1)	2.486336 (43.8089) [5.67542]
GR(-1)	-7.870274 (27.1542) [-2.89836]
MS(-1)	-1.182954 (13.8907) [-8.51616]
EXCHR(-1)	-0.078657 (0.05001) [-1.57291]
C	-6.007336

Error Correction:	D(INFR)	D(GE)	D(GR)	D(MS)	D(EXCHR)
CointEq1	-0.900812 (0.17125) [-5.26024]	-0.001875 (0.00220) [-0.85335]	0.003180 (0.00293) [1.08602]	-0.001393 (0.00219) [-0.63463]	-0.242114 (0.46173) [-0.52437]
D(INFR(-1))	0.747971 (0.17566) [4.25805]	0.001227 (0.00225) [0.54452]	-0.001482 (0.00300) [-0.49346]	0.001343 (0.00225) [0.59678]	0.140629 (0.47362) [0.29692]
D(INFR(-2))	0.351419 (0.16776) [2.09478]	0.001604 (0.00215) [0.74537]	0.000724 (0.00287) [0.25226]	0.001836 (0.00215) [0.85399]	0.068027 (0.45232) [0.15040]
D(GE(-1))	182.6057 (38.3017)	-0.142709 (0.49138)	-0.269333 (0.65494)	0.492636 (0.49078)	-10.85909 (103.270)

	[4.76756]	[-0.29042]	[-0.41124]	[1.00378]	[-0.10515]
D(GE(-2))	67.56142 (37.1060) [1.82077]	0.558563 (0.47604) [1.17334]	1.030849 (0.63449) [1.62469]	0.872139 (0.47546) [1.83430]	-27.44931 (100.046) [-0.27437]
D(GR(-1))	-38.15192 (22.3740) [-1.70519]	-0.049023 (0.28704) [-0.17079]	-0.328067 (0.38258) [-0.85751]	0.023115 (0.28669) [0.08063]	-47.49704 (60.3255) [-0.78735]
D(GR(-2))	18.08884 (26.7757) [0.67557]	-0.302324 (0.34351) [-0.88009]	-0.744856 (0.45785) [-1.62686]	-0.270746 (0.34309) [-0.78913]	-16.40291 (72.1936) [-0.22721]
D(MS(-1))	-66.33679 (25.2343) [-2.62884]	-0.001282 (0.32374) [-0.00396]	0.389855 (0.43149) [0.90351]	-0.326251 (0.32334) [-1.00900]	-5.853571 (68.0376) [-0.08603]
D(MS(-2))	-64.35033 (21.2164) [-3.03305]	-0.042991 (0.27219) [-0.15794]	0.050114 (0.36279) [0.13814]	-0.229292 (0.27186) [-0.84342]	18.86992 (57.2044) [0.32987]
D(EXCHR(-1))	0.160636 (0.11378) [1.41178]	-0.000811 (0.00146) [-0.55544]	-0.002518 (0.00195) [-1.29398]	-0.000292 (0.00146) [-0.19999]	0.326758 (0.30678) [1.06511]
D(EXCHR(-2))	0.048879 (0.10590) [0.46156]	9.46E-06 (0.00136) [0.00696]	-0.001040 (0.00181) [-0.57447]	-0.000482 (0.00136) [-0.35520]	-0.131803 (0.28553) [-0.46161]
C	-7.872082 (3.49082) [-2.25508]	0.086808 (0.04478) [1.93833]	0.092679 (0.05969) [1.55264]	0.057665 (0.04473) [1.28919]	15.32904 (9.41208) [1.62866]
R-squared	0.754374	0.343835	0.404498	0.249719	0.284248
Adj. R-squared	0.585505	-0.107279	-0.004909	-0.266100	-0.207832
Sum sq. resids	1069.603	0.176047	0.312740	0.175617	7775.674
S.E. equation	8.176195	0.104895	0.139808	0.104767	22.04494
F-statistic	4.467233	0.762191	0.988009	0.484121	0.577646
Log likelihood	-90.73001	31.23866	23.19393	31.27290	-118.5020
Akaike AIC	7.337858	-1.374190	-0.799566	-1.376636	9.321571
Schwarz SC	7.908803	-0.803245	-0.228621	-0.805691	9.892516
Mean dependent	0.305000	0.075357	0.072857	0.086071	10.64679
S.D. dependent	12.69965	0.099684	0.139466	0.093108	20.05884
Determinant resid covariance (dof adj.)		0.004988			
Determinant resid covariance		0.000304			
Log likelihood		-85.26827			
Akaike information criterion		10.73345			

Schwarz criterion 13.82607

Model 3: Error Correction Model (VECM)

Vector Error Correction Estimates

Date: 03/22/20 Time: 13:37

Sample (adjusted): 1991 2018

Included observations: 28 after adjustments

Standard errors in () & t-statistics in []

Cointegrating Eq:	CointEq1
UNEMPR(-1)	1.000000
GE(-1)	3.842010 (4.82383) [7.96464]
GR(-1)	-1.940717 (2.92917) [-6.62549]
MS(-1)	-1/679077 (1.68623) [-9.95759]
EXCHR(-1)	-0.041369 (0.00675) [-6.12458]
C	-1.105048

Error Correction:	D(UNEMP R)	D(GE)	D(GR)	D(MS)	D(EXCHR)
CointEq1	-1.304827 (0.23270) [-5.60745]	-0.002892 (0.02496) [-0.11586]	0.024020 (0.03460) [0.69421]	0.039109 (0.02276) [1.71799]	1.375913 (4.32937) [0.31781]
D(UNEMPR(-1))	0.234412 (0.19702) [1.18980]	0.009525 (0.02114) [0.45063]	-0.028646 (0.02930) [-0.97782]	-0.026962 (0.01927) [-1.39885]	3.442416 (3.66558) [0.93912]
D(UNEMPR(-2))	0.220445 (0.13659) [1.61388]	0.005413 (0.01465) [0.36941]	-0.005420 (0.02031) [-0.26687]	0.000563 (0.01336) [0.04213]	-1.576258 (2.54136) [-0.62024]
D(GE(-1))	36.92348 (9.70684) [3.80386]	-0.397032 (1.04138) [-0.38126]	-0.738519 (1.44337) [-0.51166]	-1.249870 (0.94961) [-1.31619]	-116.3820 (180.599) [-0.64442]

D(GE(-2))	15.05107 (7.24613) [2.07712]	0.710628 (0.77739) [0.91413]	0.264553 (1.07747) [0.24553]	-0.098403 (0.70888) [-0.13881]	24.00284 (134.817) [0.17804]
D(GR(-1))	-15.92715 (5.67440) [-2.80684]	0.044227 (0.60877) [0.07265]	0.073998 (0.84376) [0.08770]	0.918227 (0.55512) [1.65410]	1.008115 (105.574) [0.00955]
D(GR(-2))	-8.752379 (4.73316) [-1.84916]	-0.500474 (0.50779) [-0.98560]	-0.235239 (0.70380) [-0.33424]	0.231323 (0.46304) [0.49957]	-60.41929 (88.0620) [-0.68610]
D(MS(-1))	-8.534945 (3.37033) [-2.53237]	0.152990 (0.36158) [0.42312]	0.391930 (0.50115) [0.78205]	0.242529 (0.32972) [0.73557]	30.01281 (62.7061) [0.47863]
D(MS(-2))	-11.97142 (2.58701) [-4.62752]	-0.010169 (0.27754) [-0.03664]	0.283346 (0.38468) [0.73658]	0.086762 (0.25309) [0.34282]	1.863983 (48.1321) [0.03873]
D(EXCHR(-1))	-0.000866 (0.01523) [-0.05687]	-0.000800 (0.00163) [-0.48988]	-0.001921 (0.00226) [-0.84844]	0.000242 (0.00149) [0.16229]	0.565121 (0.28331) [1.99471]
D(EXCHR(-2))	0.066062 (0.01467) [4.50310]	-0.000538 (0.00157) [-0.34177]	0.000586 (0.00218) [0.26884]	-0.000146 (0.00144) [-0.10172]	-0.597148 (0.27295) [-2.18779]
C	-0.827609 (0.50394) [-1.64228]	0.081165 (0.05406) [1.50128]	0.098438 (0.07493) [1.31367]	0.094534 (0.04930) [1.91753]	18.44964 (9.37592) [1.96777]
R-squared	0.904411	0.323739	0.336310	0.355438	0.497695
Adj. R-squared	0.838693	-0.141191	-0.119978	-0.087699	0.152361
Sum sq. resids	15.76409	0.181438	0.348551	0.150871	5456.856
S.E. equation	0.992600	0.106489	0.147596	0.097105	18.46763
F-statistic	13.76206	0.696318	0.737057	0.802096	1.441199
Log likelihood	-31.68770	30.81633	21.67616	33.39918	-113.5442
Akaike AIC	3.120550	-1.344023	-0.691155	-1.528513	8.967443
Schwarz SC	3.691495	-0.773078	-0.120210	-0.957568	9.538388
Mean dependent	0.497500	0.075357	0.072857	0.086071	10.64679
S.D. dependent	2.471427	0.099684	0.139466	0.093108	20.05884
Determinant resid covariance (dof adj.)		0.000153			
Determinant resid covariance		9.33E-06			
Log likelihood		-36.49220			
Akaike information criterion		7.249443			
Schwarz criterion		10.34206			