A Predictive Model For Nigeria's External Debt: New Evidence And Insights

Ikechukwu. S. Nnamdi[1*]   Daniel E. Eniekezimene[2]
snnamdi95@gmail.com   dan.enieke@gmail.com
* - Department of Finance and Banking, University Of Port Harcourt, Port Harcourt, Nigeria.

*E-mail of the corresponding author: snnamdi95@gmail.com

ABSTRACT

Motivated by the urge to search for improved prediction of the prevailing empirical interrelationships between Nigeria's external debt and the acclaimed primary causants from received literature (productivity index, inflation rate, foreign reserves, population and balance of payment on current account), this study builds on the earlier studies of Isu (1997) as well as Nnamdi and Omojefe (2009). Secondary data was obtained from Central Bank of Nigeria's Statistical Bulletin over the period 1986 to 2016. Stationarity, Multiple Regression, Johansen's Cointegration, Error Correction and Granger Causality tests were employed in processing the obtained data on incremental/change basis. The results obtained represent obvious improvements on earlier studies of Isu (1997) as well as Nnamdi and Omojefe (2009). They provide evidence that in the short run, inflation rate and population are significant predictive variables for Nigeria's external debt. The long run analysis reveals that inflation rate, foreign reserves and balance of payment on current account are reliable predictors of Nigeria's external debt. Further, inflation rate and Nigeria's balance of payment on current account are found to be significantly promoted by Nigeria's external debt. The study concludes that combined, inflation rate, balance of payment on current account, foreign reserves, and population constitute reliable predictors of Nigeria's external debt depending on whether short or long run perspective is taken. On the whole, it is recommended that Nigeria's Central Bank should address anti-inflationary measures, while the government should step up campaign efforts towards population control. Intensified diversification of the economy through increased private sector participation in non-oil related businesses is strongly recommended in order to boost Nigeria's export earnings, external reserves and balance of payment positions.

Keywords: External Debt, Economic Performance, Development financing.

1. INTRODUCTION

Developing nations have often employed external debts in financing economic growth. It serves to augment and also, supplement domestic financial resources in order to meet the financial requirements of planned development projects desired to sustain and/or accelerate economic development. Jhingan (2008) observes that developing economies engage in extensive external borrowing purposely to fund importation of capital equipments, raw materials, technical know-how and consumer goods essentially needed to meet the increasing requirements of the growing population. On the other hand, Todaro and Smith (2009) argue that while external borrowing can be highly beneficial in terms of funding economic growth, it can also, induce very costly consequences if poorly managed. However, whether at national or corporate level, the traditional school of thought in finance literature as evidenced in the assertions of Solomon (1971) and Durand (1976), insists that leverage increases the value of an organization provided that the marginal productivity of the borrowed funds exceeds their cost.

Given the core relevance of external debt in the financial operations of developing economies, this pattern of study is therefore, very relevant for any nation which is desirous of ascertaining the verifiable relationships around which, reliable policies can be articulated with the intention of guiding the spate, process and pattern of utilizing external debt windows. This approach is with a view to influencing the nation's economic development process in a rational manner. Accordingly, this study anchors on the premise that the nature of empirical interrelationships between the primary determinants (causants) of Nigeria's outstanding external debts at several points in time has neither been clearly identified nor estimated. The primary objective of this study therefore, is to evaluate empirically, the extent to which the received theory of Primary Causants of external debts of developing nations serves to predict and/or explain the periodic variations in Nigeria's external debt in both short and long terms in the light of recent data. Further, this study equally examines the extent to which the paired

elements of Nigeria's external debt and each of the primary causants do promote, support and/or re-inforce one another in the growth process. The results of this study while adding to the growing body of literature, is hoped to shed further light on the nature of prevailing interrelationships between Nigeria's external debt and its determinants. To that extent, they are hoped to provide a valuable basis for rational and objective policy making inputs with respect to Nigeria's periodic external borrowing and management. Having provided an overview as above, the balance of this study will be rendered in four sections. Section 2 provides a review of key propelling studies while the third section provides the materials and methods adopted. Section 4 deals with the results obtained and analysis of same, while section 5 offers the discussions, conclusions and policy recommendations.

2. REVIEW OF KEY PROPELLING STUDIES:

In a lead study, Isu (1997) attempts to provide a model for prediction of Nigeria's external debt balances given the set of factors termed primary causants of national external debt. These primary causants embrace productivity index, inflation rate, foreign reserves, population and balance of payment on current account. Citing authorities who include Killick, Mehran, Printo and Fajana, the study attempts to provide a valuable framework for prediction of the periodic values of Nigeria's external debt in the light of the above primary causants. The study employs yearly outstanding values of Nigeria's external debt as the dependent variable, and proceeds to estimate, as well as test the nature of prevailing relationships between Nigeria's external debt and each of the five (5no) explanatory variables.

The approach was implemented through a purposeful utilization of five sets of independent simple regression equations on employment of secondary data covering the period 1973 to 1984. The results of the study provide compelling evidence to conclude within the period covered, that only Nigeria's population is significant in predicting Nigeria's external debt balances. In that wise, the rest other primary causants-productivity index, inflation rate, foreign reserves and balance of payment on current account failed the significance test at 0.05 level. Given the fact that only population passed the litmus test, the study calls for an urgent evolution of improved models for prediction of Nigeria's external debt based on factors that are meaningfully related to the nation's economic growth within the macroeconomic environment and framework. In response to Isu (1997), Nnamdi and Omojefe (2009) attempt a revisit on the subject through employment of secondary data over the period 1986 to 2006. Reasoning that the set of primary causants as well as eternal debt are all interreled set of variables within the socio-economic milleu, the study posits that the prevailing interrelationships between Nigeria's external debt and the primary causants can be evaluated through a multivariate analytical framework. Further, the study sort to evaluate the combined predictive effects of these primary causants on external debt and also, prioritize the primary causants by employment of stepwise regression technique. The results of the study surprisingly, show that all the primary causants failed the significance test. Consequently, the study calls for a review of Nigeria's external debt psychology as the observed development tends to abstract from all the received theory on the primary causants so far.

3. MATERIALS AND METHODS:

For ease of analysis, this section is further partitioned into the following sub-sections:

3.1 Data Employed and Variables Description:

This study's variables include the end of year values of Nigeria's external debt, productivity index, inflation rate, foreign reserves, population and balance of payment on current account. They were sourced from Central Bank of Nigeria's Statistical Bulletin covering the period 1986 to 2016 (31 years) as shown in Appendix I.

3.2 Model Justification and Specifications:

A lot of developments have taken place with respect to Nigeria's external debt since the appearance of the above two key propelling studies. These include; (i) Nigeria has re-negotiated her foreign debt obligations, received some reliefs and is currently paying according to terms. (ii) The country has also, obtained new foreign credit lines to aid implementation of critically desired projects. (iii) The debt management office has been re-engineered for improved performance and consequent management of Nigeria's external and domestic debts. Given the developments above, it is obvious that appreciable changes in terms of quantity and quality have also followed. Further, while Isu (1997) as well as Nnamdi and Omojefe (2009) employ short-run analytical techniques, it is obvious that the values of Nigeria's external debt as well as those of the primary causants have

also, undergone significant changes which could be in the positive or negative directions over the years. In this respect, this study deems it appropriate to evaluate the relevance of the primary causants of Nigeria's external debt in terms of the periodic growths or changes in the values of the study variables in order to capture the short and long run dynamics and also, bring all the variables to the same base. To that extent, this approach will examine the extent to which these changes do present any articulate picture of the predictive interrelationships in both the short and long runs with respect to current data as shown in Appendix II

Accordingly, the following functional model is stated to capture the dynamics posed;

$$\Delta EXD = f(\Delta PI, \Delta IR, \Delta FR, \Delta PP, \Delta BPCA) \qquad (1)$$

Where;

ΔEXD is change in external debt, ΔPI represents change in productivity index, ΔIR stands for change in inflation rate, ΔFR is change in foreign reserves, ΔPP stands for change in population, while $\Delta BPCA$ represents change in balance of payment on current account.

For estimation purposes, equation (i) is rewritten as follows;

$$\Delta EXD_t = \beta_0 + \beta_1 \Delta PI_t + \beta_2 \Delta IR_t + \beta_3 \Delta FR_t + \beta_4 \Delta PP_t + \beta_5 \Delta BPCA_t + \mu_t \qquad (2)$$

Where ΔEXD, ΔPI, ΔIR, ΔFR, ΔPP, and $\Delta BPCA$ retain their previous notations, while $\beta_1, \beta_2, \beta_3, \beta_4$ and β_5 are their coefficients respectively. β_0 is the constant term while μ_t is the error or stochastic term.

3.3 Apriori expectations

From theoretical point of view, an increase in a country's productivity index would naturally reduce demand for foreign debt and accordingly, a negative relationship would be expected. Inflation on the other hand, would erode the real value of money and therefore, induce more demand for foreign debt. A positive relationship is therefore expected. The more a nation's foreign reserves, it is theoretically expected that it will correspondingly induce decline in demand for foreign debts. Therefore a negative relationship is anticipated. Increasing population would put more pressure on the nation to meet the basic needs of the populace. Therefore a positive relationship is expected between population growth and demand for foreign debt. Lastly, A favourable current account balance in a nation's balance of payment signifies improved financial position and would naturally lead to a reduction in demand for foreign debt. In summary, we expect that the sensitivities of external debt to the above study variables would be as follows;

$\beta_1 < 0; \beta_2 > 0; \beta_3 < 0; \beta_4 > 0; \beta_5 < 0;$

3.2 Specification of Analytical Tools and Tests.

This study is basically driven by the need to provide empirical basis for prediction of Nigeria's external debt in both short and long terms and also, evaluate the extent the study variables promote themselves. For clarity, this sub-section is further detailed as follows:

3..2.1 Stationarity Tests:

It is necessary to ascertain the unit root properties of given time series data in order to avoid spurious estimates. The decision rule in accordance with Brooks (2009) is that the ADF test statistics must on absolute basis, be higher than all the associated Mackinnon's critical values at 1%, 5% and 10% levels of significance respectively.

3.2.2 Multiple Regression Analysis

To evaluate the short run dynamic relationships among the study variables, the multiple regression technique is employed. The decision rule is that for significance, the coefficient of a given explanatory variable must be significant at least at 0.05 level.

3.2.3 Johansen's Cointegration Test:

Johansen's Co-integration technique is utilized to examine the value of longrun relationship that prevails among the given set of study variables under study according to Maddala (2007) and Brooks (2009). For decision, the value of the Max-Eigen statistics must be higher than the corresponding critical value at 0.05 level.

3.2.4 Error Correction Estimates.

Error Correction Estimates according to Brooks (2009) tend to evaluate the long run sensitivities of a dependent variable to each given explanatory variable. Further, it shows the speed at which the explained variable adjusts to equilibrium in the long run given short run deviations in the explanatory variables.

3.2.5 Granger Causality Test:

Following Maddala (2007) and Brooks (2009), Pairwise-Granger Causality tests serve to evaluate the extent to which variations in a set of independent variables tend to promote, support and reinforce variations in the explained variable. It also shows the extent to which addition of their previous values can enhance the explanation and vice-versa in accordance with equations (3) and (4) below;

$$\gamma t = \beta 0 + \sum_{i=k}^{n} \quad \beta i \gamma t - i + \sum_{i=k}^{n} \quad \beta \mu \, X t - i + \mu t \qquad (3)$$

$$X t = \alpha 0 + \sum_{i=k}^{n} \quad \alpha i \gamma t - i + \sum_{i=k}^{n} \quad \alpha i \, \gamma t - i + V t \qquad (4)$$

4. PRESENTATION OF RESULTS:

4.1: Presentation of Stationarity Test Results:

The results of Stationairty test executed are presented in table 1 below:

Table 1: Results of Stationarity (Unit Root) test:

Variable	ADF t-statistics	Critical Value 5%			Order of Integration	Prob.
		1%	5%	10%		
D(EXD)	-8.257094	-3.689194	-2.971853	-2.625121	I(1)	0.0000
D(PI)	-10.57380	-3.689194	-2.971853	-2.625121	I(1)	0.0000
D(IR)	-8.904692	-3.689194	-2.971853	-2.625121	I(1)	0.0000
D(FR)	-7.443550	-3.699871	-2.976263	-2.627420	I(1)	0.0000
D(PP)	-8.706225	-3.689194	-2.971853	-2.625121	I(1)	0.0000
D(BPCA)	-5.355329	-3.724070	-2.986225	-2.632604	I(1)	0.0002

Source: Extracts from Eviews 10 output.

Note: D(EXD), D(PI), D(IR), D(FR), D(PP) and D(BPCA) represent differenced variants of external debt, productivity index, inflation rate, foreign reserves, population and balance of payment on current account.

It could be observed that the absolute values of each of the study variables remains higher than each of the corresponding Mackinnon's critical values at 1%, 5% and 10% respectively. Therefore, all the study variables are found stationary and integrated of order I(1), thereby, suitable for employment in further analysis.

4.2 Presentation of Multiple Regression Results (Short Run Analysis):

The results of multiple regression analysis are presented in table 2 below:

Table 2: Results of Multiple Regression Test:
Dependent Variable: D(EXD)
Method: Least Squares
Date: 09/06/17 Time: 14:23
Sample (adjusted): 1988 2016
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.057618	1.138055	-0.929320	0.3624
D(PI)	0.005298	0.335346	0.015799	0.9875
D(IR)	-0.044371	0.018645	-2.379784	0.0260
D(FR)	-0.121085	0.122678	-0.987019	0.3339
D(PP)	40.04202	37.77872	3.059910	0.0002
D(BPCA)	0.011858	0.077500	0.153002	0.8797

R-squared	0.571534	Mean dependent var	-0.027028
Adjusted R-squared	0.556650	S.D. dependent var	0.869538
S.E. of regression	0.697448	Akaike info criterion	2.299215
Sum squared resid	11.18799	Schwarz criterion	2.582104
Log likelihood	-27.33862	Hannan-Quinn criter.	2.387812
F-statistic	4.104442	Durbin-Watson stat	2.003606
Prob(F-statistic)	0.008246		

Source: Extracts from Eviews 10 output.

The multiple regression test results presented in table 2 above show that in the short run, only the coefficients of inflation rate and population are statistically valuable in explaining variations in Nigeria's external debt over the period of study. Other study explanatory variables- productivity index, foreign reserves and balance of payment on current account failed the significance test at 0.05 level. On the whole, the R^2 value of 0.571534 implies that variations in the study's set of explanatory variables only explain 57.15 percent of the changes in Nigeria's external debt in the short run. The probability value of the f-statistic (0.008246) confirms significance and good line of fit, while the Durbin-Watson statistic value of 2.003606 is within tolerable range.

4..3: Presentation of Results of Johansen's Cointegration test:
The results of Johansen's Co-integration test are shown in table 3 below:
Table 3: Johansen's Cointegration Test Results:
Date: 09/06/17 Time: 14:26
Sample (adjusted): 1990 2016
Included observations: 27 after adjustments
Trend assumption: Linear deterministic trend
Series: D(EXD) D(PI) D(FR) D(PP) D(BPCA)
Lags interval (in first differences): 1 to 1
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.789215	43.59369	40.07757	0.0193
At most 1*	0.569812	23.61892	33.87687	0.0037
At most 2*	0.386447	13.67769	27.58434	0.0442
At most 3	0.336672	11.49358	21.13162	0.5980
At most 4	0.266740	8.687152	14.26460	0.3131
At most 5	0.159718	4.872503	3.841466	0.0773

Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level
 * denotes rejection of the hypothesis at the 0.05 level
 **MacKinnon-Haug-Michelis (1999) p-values
Source: Extracts from Eviews 10 output.

The results of Johansen's Co-integration test shown in table 3 above provide valuable evidence of prevailing significant long run relationship among Nigeria's external debt, and the primary causants on the basis of existence of three cointegrating equations.

4.4 Presentation of Results of Error Correction Model:
The results of Error Correction Estimation executed are shown in table 4 below:

Table 4: Results of Error Correction Estimation:
Dependent Variable: D(EXD)
Method: Least Squares
Date: 09/06/17   Time: 14:29
Sample (adjusted): 1989 2016
Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.692279	1.180717	-0.586321	0.5639
PI	-0.029694	0.339096	-0.087567	0.9311
IR	-0.031835	0.026394	-2.206133	0.0412
FR	-0.165308	0.128704	-3.284404	0.0130
PP	28.22711	39.56020	0.713523	0.4834
BPCA	0.013178	0.076595	2.172042	0.0451
ECM(-1)	-1.355364	0.451654	-3.000881	0.0200

R-squared	0.600616	Mean dependent var	0.011375
Adjusted R-squared	0.557934	S.D. dependent var	0.860086
S.E. of regression	0.689178	Akaike info criterion	2.305685
Sum squared resid	9.974302	Schwarz criterion	2.638736
Log likelihood	-25.27958	Hannan-Quinn criter.	2.407502
F-statistic	3.508629	Durbin-Watson stat	1.960476
Prob(F-statistic)	0.014579		

Source: Extracts from Eviews 10 output.

The estimation of long run relationship prevailing between Nigeria's external debt and each of the primary causants captured with Error Correction Estimation technique as shown in table 4 above- provides evidence of significant long run relationship between Nigeria's external debt and each of inflation rate, foreign reserves and balance of payment on current account, while productivity index and population fail the test. While the coefficient of Error Correction model (ECM) has the expected negative sign, the ECM absolute value of 0.295536 implies that about 29.55% of the disequilibrium in Nigeria's external debt is offset by variations in the primary causants within the year. The coefficient of determination (R^2) value of 60.01 percent indicates that 60.01% of the variations in Nigeria's external debt is explained in the long run, by variations in the primary causants. On the whole, the model is of good fit as indicated by the probability of the f-statistic (0.014579), which is significant at 0.05 level. Equally, the Durbin-Watson statistic is within acceptable limit. On the whole, the results reveal negative but significant long run relationship between external debt and each of inflation rate and foreign reserves, while balance of payment on current account is positively significant in the long run.

4.5: Presentation of the Results of Pair-wise Granger Causality Tests:
The results of Pair-wise Granger Causality tests executed for this study are presented in table 5 below:

Table 5: Results of Pairwise Granger Causality Test:

Date: 09/06/17   Time: 14:27

Sample: 1987 2016

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
PI does not Granger Cause EXD	28	0.24331	0.7860
EXD does not Granger Cause PI		0.79800	0.4623
IR does not Granger Cause EXD	28	0.02210	0.9782
EXD does not Granger Cause IR		49.1308	0.0059
FR does not Granger Cause EXD	28	0.27467	0.7623
EXD does not Granger Cause FR		0.02188	0.9784
PP does not Granger Cause EXD	28	0.07728	0.9259
EXD does not Granger Cause PP		1.33381	0.2831
BPCA does not Granger Cause EXD	28	0.55729	0.5803
EXD does not Granger Cause BPCA		13.6731	0.0001

Source: Extracts from E-views 10 output.

The results of Pair-Wise Granger Causality test shown in table 5 above provide evidence of existence of no bi-directional causal relationship among the paired variables of study. However, two uni-directional causal relationships prevail. They are between Nigeria's external debt and inflation rate on one hand and balance of payment on current account on the other. In each instance, Causality flows from Nigeria's external debt to inflation rate as well as balance of payment on current account.

5. DISCUSSIONS, CONCLUSIONS AND POLICY RECOMMENDATIONS.

This study basically derives from the perspective of capturing the changes/dynamics in the study variables over the period of study. Obviously, the outcomes represent very serious and remarkable improvements over the results of Isu (1997) as well as Nnamdi and Omojefe (2009) through provision of a more robust and reliable model for determining the predictive efficacies of the primary causants of national external debts with respect to Nigeria. While the short run analysis depicted by the results of multiple regression test indicate inflation rate and population as significant determinants of external debt, the long run analysis demonstrated by the error correction estimates indicates that inflation rate, foreign reserves and balance of payment on current account are the critical long run determinants of Nigeria's external debt. These results provide basis for two categories of policy strategies towards employment and management of foreign debts in Nigeria. The implication broadly, is that Nigeria's Central Bank as well as Debt Management Office should develop two sets of strategies for short term and long term management of Nigeria's external debt. In the short-run, the strategies should address measures to curb high inflation and population growth rates. In the long run, the strategies should incorporate measures to address inflation rate, foreign reserves and balance of payment on current account.

The Granger Causality results however show that Nigeria's external debts promote inflation rate as well as support variations in Nigeria's balance of payment on current account. These results are in line with destabilization effects of foreign debts on the economies of debtor nations, including Nigeria. It culminates in high inflation rates as well as depreciation in debtor country's currency exchange rates. These results from the adverse effects of external debt repayments on the debtor country's balance of payment on current account. In line with the above results, it is concluded that inflation rate, balance of payment on current accounts, foreign reserves and population can form significant bases for prediction of Nigeria's external debt. Accordingly, it is recommended that; (i) Nigeria's Central Bank should take more proactive monetary policy measures to ensure that inflation rate is minimized (ii) The government should step up campaign programmes to address population control. (iii) Intensified efforts should be made to encourage the private sector in Nigeria to participate increasingly in diversification of exports, especially, the non-oil related exports. This diversification is necessary to boost Nigeria's foreign reserves and improve her balance of payment on current account. These measures will obviously, induce reduction in external borrowing in the interest of the Nigerian economy.

References

Brooks, C. (2009). Introductory Econometrics for Finance, Cambridge, Cambridge University Press,333-343; 353-373; 373-396.

Durand, D. (1976). Cost of Debt and Equity Funds for Business: Trends and Problems of Measurement, in Archer, S.H. and D'Ambrosio, C. A. (ed), The Theory of Business Finance; A Book of Readings, New-York, Collier Macmillan,420-452.

Isu, H.O. (1997). A Predictive Model for Nigeria's External Debt, *Journal of Finance, Banking and Investment*, 1(1), 45-53.

Jhingan,M.L.(2008). The Economics of Development and Planning, Delhi, Vrinda Publications, 439.

Maddala,G. S. (2007). Introduction to Econometrics, New Delhi, Willey-India, 556-566; 379-380.

Nnamdi, I. S & Omojefe, G. O. (2009). A Prediction Model for Nigeria's External Debt: A Revisit, *Journal of Finance, Banking and Investment*, 3(1), 131-139.

Solomon,E. (1971). Leverage and the Cost of Capital, in Brigham,E. F. (ed), Readings in Managerial Finance, Illinois, Dryden Press, 159-172.

Todaro, M. P., & Smith, S. C. (2009). Economic Development, New York, Addisson-Wesley, 675.

Journal of Economics and Sustainable Development
www.iiste.org
ISSN 2222-1700 (Paper) ISSN 2222-2855 (Online)
Vol.9, No.4, 2018

APPENDIX 1:

Annual Values of External Debt (EXD) $'B, Productivity Index (PI), Inflation Rate (IR) %, Foreign Reserves (FR) $'M, Population (PP) (Millions) and Balance Payment on Current Account (BPCA) $'M in Nigeria over the period of 1986 to 2016.

Year	External Debt (EXD) $'B	Productivity Index (PI)	Inflation Rate (IR) %	Foreign Reserves (FR) $'M	Population (PP) (Millions)	Balance Payment on Current Account (BPCA) $'M
1986	41.4524	52.22	13.7	2836.6	77.538	8.0066
1987	100.7891	75.44	9.7	7504.58891	79.709	17.1382
1988	133.9563	95.6	61.2	5229.10459	81.941	31.5861
1989	240.3937	129.54	44.7	3047.61909	84.236	59.112
1990	298.6144	100	3.6	4541.44783	86.53	79.8101
1991	328.4538	166.04	23	4149.2977	89.263	51.9698
1992	544.2641	259.52	48.8	1554.60735	92.057	93.6805
1993	633.1444	318.12	61.3	1429.59	94.934	(34.41)
1994	648.813	405.44	76.8	9009.10992	97.9	(52.3)
1995	716.8656	824.44	51.6	1611.11	100.959	(186.1)
1996	617.32	1098.07	14.3	3403.90977	104.095	376.0
1997	595.9319	1108.76	10.2	7222.21541	107.286	263.3
1998	633.017	1026.97	11.9	7107.5	110.532	(331.4)
1999	2577.3744	1190.37	0.2	5424.6	113.829	46.3
2000	3097.3839	1628.2	14.5	9386.1	117.171	713.0
2001	3176.291	1596.91	16.5	10267.1	120.686	242.9
2002	3932.8848	1725.54	12.2	7681.1	124.307	(117.0)
2003	4478.3293	2002.7	23.8	7467.78	128.036	704.6
2004	4890.2696	2002.7	10	16955.02	131.877	2,056.3
2005	2695.0722	2179.98	11.6	28279.06	135.833	1,989.1
2006	451.4617	2582.98	8.5	42298.11	139.908	2,289.7
2007	438.8908692	107.9671	6.6	51333.15	146.417	2,333.5
2008	523.254088	120.211	15.1	53000.36	150.347	2,417.8
2009	590.437134	83.03986	13.9	42382.49	154.402	2,883.0
2010	689.8374882	188.2595	11.8	32339.252	158.578	3,111.9
2011	896.8496166	107.0323	10.3	32639.78	162.877	3,355.2
2012	1026.903923	104.3796	12	43830.42	167.297	3,435.1
2013	1387.331994	103.764	7.96	42847.31	171.829	3,430.1
2014	1631.52192	104.4731	7.98	34241.54	176.46	3,448.8
2015	2111.53071	81.91297	9.55	28284.82	181.181	3,962.9
2016	3478.9154	95.34954	18.55	26990.58	185.989	5,025.8

Source: Central bank of Nigeria statistical bulletin and the Nigerian Stock Exchange NSE (2016).

APPENDIX 1I:

Table 2: Standardized (Percentage Change) Data for External Debt (EXD), Productivity Index (PI), Inflation Rate (IR), Foreign Reserves (FR), Population (PP) and Balance Payment on Current Account (BPCA) in Nigeria over the period 1986 to 2016.

	EXD	PI	IR	FR	PP	BPCA
1986	NA	NA	NA	NA	NA	NA
1987	143.14%	44.47%	-29.20%	164.56%	2.80%	114.05%
1988	32.91%	26.72%	530.93%	-30.32%	2.80%	84.30%
1989	79.46%	35.50%	-26.96%	-41.72%	2.80%	87.15%
1990	24.22%	-22.80%	-91.95%	49.02%	2.72%	35.02%
1991	9.99%	66.04%	538.89%	-8.63%	3.16%	-34.88%
1992	65.70%	56.30%	112.17%	-62.53%	3.13%	80.26%
1993	16.33%	22.58%	25.61%	-8.04%	3.13%	-136.74%
1994	2.47%	27.45%	25.29%	530.19%	3.12%	51.98%
1995	10.49%	103.34%	-32.81%	-82.12%	3.12%	255.77%
1996	-13.89%	33.19%	-72.29%	111.28%	3.11%	-302.07%
1997	-3.46%	0.97%	-28.67%	112.17%	3.07%	-29.98%
1998	6.22%	-7.38%	16.67%	-1.59%	3.03%	-225.88%
1999	307.16%	15.91%	-98.32%	-23.68%	2.98%	-113.98%
2000	20.18%	36.78%	7150.00%	73.03%	2.94%	1438.80%
2001	2.55%	-1.92%	13.79%	9.39%	3.00%	-65.93%
2002	23.82%	8.05%	-26.06%	-25.19%	3.00%	-148.18%
2003	13.87%	16.06%	95.08%	-2.78%	3.00%	-702.00%
2004	9.20%	0.00%	-57.98%	127.04%	3.00%	191.86%
2005	-44.89%	8.85%	16.00%	66.79%	3.00%	-3.27%
2006	-83.25%	18.49%	-26.72%	49.57%	3.00%	15.11%
2007	-2.78%	-95.82%	-22.35%	21.36%	4.65%	1.91%
2008	19.22%	11.34%	128.79%	3.25%	2.68%	3.61%
2009	12.84%	-30.92%	-7.95%	-20.03%	2.70%	19.24%
2010	16.84%	126.71%	-15.11%	-23.70%	2.70%	7.94%
2011	30.01%	-43.15%	-12.71%	0.93%	2.71%	7.82%
2012	14.50%	-2.48%	16.50%	34.29%	2.71%	2.38%
2013	35.10%	-0.59%	-33.67%	-2.24%	2.71%	-0.15%
2014	17.60%	0.68%	0.25%	-20.08%	2.70%	0.54%
2015	29.42%	-21.59%	19.67%	-17.40%	2.68%	14.91%
2016	64.76%	16.40%	94.24%	-4.58%	2.65%	26.82%

Source: Extracts from E-views 10 output.