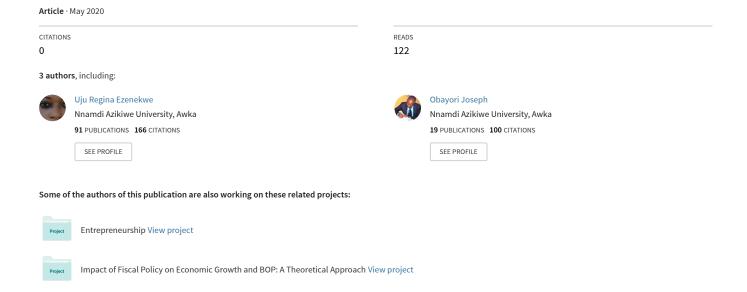# IMPACT OF SECLECTED MACROECONOMIC AGGREGATES ON ECONOMIC GROWTH IN NIGERIA: A THREE STAGE METHODICAL PROCESS

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IMPACT OF SECLECTED MACROECONOMIC AGGREGATES ON ECONOMIC GROWTH IN NIGERIA: A THREE STAGE METHODICAL PROCESS.

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ABSTRACT

This paper empirically examined the impact of selected macroeconomic aggregates on economic growth in Nigeria from 1985-2014 via a three stage methical processes. This is because, the basic macroeconomic indicators suchgeneral price level, exchange rate and BOP which serve as the drivers of the economy have not performed creditably well in order to spur growth. Thus, the objectives of the study were to;determinethe impact of inflation rate, e x c h a n g e r a t e and balance of payments on Nigeria'seconomic growth. To achieve the stated objectives, secondary data on GDP, inflation rate, exchange rate and BOP were collected through CBN statistical bulletin and estimated via the, co-integration and granger causality techniques. The result of the ADF unit root test shows that all the variables were found to be stationary. Also, the co-integration carried out using the Johansen co-integration technique shows that there is a long run relationship amongst the variables. Thus, the alternative hypothesis of long run relationship between macroeconomic aggregates and gross domestic product was accepted. The Chow Test result shows that although the two period f-value were statistically significant in explaining the impact of selected macroeconomic aggregates on economic growth in Nigeria, the f-stat of 46.7 during the period of sustained democracy is greater than the f-value of 36.5 before the period of sustained democracy. Thus, the study concludes that macroeconomic aggregates vis-à-vis inflation rate, exchange rate and BOP impact more on economic growth in Nigeria after the period of sustained democracy than before the period of sustained democracy.Based on the findings, the paper recommended that there should be continuity and consistency of macroeconomic policy measures in the Nigerian economy to redress the problem of exchange rate variation in order to boost economic growth. Also, it is recommended that the government together with the Central Bank of Nigeria should develop and pursue prudent monetary policies that would aim at reducing and stabilizing macroeconomic indicators such as inflation, so as to boast the growth of the economy.

KEY WORDS: GDP, BOP, Exchange Rate, Inflation Rate, Macroeconomic Aggregates, ADF

1.0 INTRODUCTION

Nigeria, as a country is blessed with abundant natural resources and is seen as one of the countries that have the most volatile economy. This is in order with NEEDS (2004) which says that "between 1975 and 2000, Nigeria's broad macroeconomic aggregates - growth, terms of trade, real exchange rate, government revenue arid spending were among the most volatile in the developing world. Over the past three decades, high macroeconomic instability has become a key determinant as well as consequence of poor economic growth. The economy has found itself in a low growth trap as a result of high rate of inflation, unstable exchange rate, disequilibrium balance of payments and low savings - investment equilibrium. The Nigerian economy is still far below the minimum investment rate of about 30% of GDP required to minimize poverty (Asogwa, 2008).

Meanwhile, macroeconomic conditions are the most influential drivers of growth and development. This is imperative as NIRP(2014) concurred that a growing economy needs a competitive business environment to prosper, an environment where there is low price level, increase employment level, stable exchange rate, minimal corruption and government bureaucracy is minimized as well as stable political situation, availability of finance amongst others. The behaviours of these factors, specifically the macroeconomic variables have recently gained centre stage in explaining variations in competitiveness, growth and prosperity across countries or regions. These key factors, which are also known as investment climate, serve either as inducements or constraints to the effectiveness and productivity of firms and hence the growth of the economy (Bakare, 2013).

According to Obayori, Nwogwugwu and Omozuawo (2016), Nigeria is currently regarded as a risk market for investment destination due to unstable macroeconomic policy, corruption and inadequate infrastructures among others. Many investors have in recent time begun to relocate their businesses away from Nigeria as a result of poor investment climate. This has resulted to drastic decline in domestic investment and industrial performances in the country. And for Nigeria to achieve its determined diversification of the economy, it must improve on key economic fundamentals. While

recent performance is transformative, sustaining such trend in the face of the existing business cycle is an enormous challenge. It is not enough to rely on capital-intensive mega projects which do not translate to growth. Growth requires functional macroeconomic variables. But there is no doubt that economic growth in Nigeria has been underperforming when compared to other developing countries in Africa like Ghana and South Africa. This is because, the basic economic indicators such as unemployment rate, price level, exchange rate, interest rate and BOP which serve as the drivers of the economy have not performed creditably well in order to spur growth. For instance, statistics from CBN (2014) shows that exchange rate moved from its level of ₦0.8938: US $ 1.00 in 1985 to ₦ 22.05: US $1.00 in 1990. It stood at ₦102.11: US $1.00 in the year 2000 and in the year 2014 exchange rate rose again from to ₦ 161.00: US $1.00. Conversely, Balance of Payments (BOP) fluctuated with negative sign from the year 1985 to 2014 except for the years 1980, 1997, 2000, 2001, 2004, 2013 and 2014 that recorded positive figures. Similarly, inflation rate has not been encouraging. For instance, in 1985 inflation rate was 5.5 percent. It increased to 7.5 percent in 1990. Inflation rate decreased to 6.9 percent in the year 2000. But from the year 2001, it increased to 18.87 percent in 2001, 11.9 percent in 2010 and 17.9 percent in 2014. According to Frimpong and Oteng (2010), a high rate of inflation beyond 14% will always hurt GDP that is why the monetary planning committee (MPC) of Nigeria is always targeting a single digit rate.

Meanwhile, successive governments in Nigeria had introduced several fiscal and monetary policies aimed at bringing inflation rate down, having favourable BOPs and as well encourage stable rate of exchange with the view to boosting economic growth as measured by GDP. While these policies might be good, the effect of these macroeconomic variables on the economy of Nigeria has not been encouraging. That is why the following questions were raised; to what extent has government pursue of its objective of single digit inflationary target impacted on economic growth in Nigeria? What is the effect of favourable BOP on economic growth in Nigeria? What is the effect of stable exchange rate on economic growth in Nigeria? Thus, the paper used a three stage methodical process to examine

macroeconomic aggregates and economic growth in Nigeria. The remaining parts of this paper discussed literature review, methodology, discussion of results and recommendations.

2.0 LITERATURE REVIEW

This section reviews important literature on macroeconomic aggregates and economic growth. It also dealt with the theoretical and empirical literature.

2.1 Theoretical Framework

Endogenous growth theory is the theoretical basis for this study. The endogenous growth theory indigenizes the rate of technological progress. It traces the rate of growth of output per capita to two main sources – savings and efficiency. It also argues that policy measures can have an impact on the long-run growth rate of an economy, even if they do not change disaggregate saving rate. Thus countries with high level of efficiency, appropriate economic system, sound economic policy, tend to grow more rapidly (Romer, 1994). Rapid growth rates are associated with country with efficient economic system and prestige (Lewis, 1978).

The efficiency argument is not entirely a new one. Economists have long held this view as they recognized technical change as important catalysts for economic growth. However, this endogenous growth theory is now being broadened to also include efforts to utilize the accumulated knowledge and other supportive conditions to optimal benefit. Thus technical change is viewed as an aspect of general economic efficiency. It is said to be good for growth as to squeeze out more output from a given input and that is what efficiency is about. Conditions that cause efficiency include education, diversification, privatization, liberalization, stabilization, strong capital market development etc. (Grossman and Helpman, 1991). Thus, liberalization of prices and rate of exchange increases stabilization and reduces inefficiency associated with inflation, and privatization reduces inefficiency associated with state-owned enterprises.

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Further in explaining economic growth path, Economic system is defined as a prevailing economic ideologies, capitalism and socialism. All other types of economic system are mere hybrids or variants of these two. It can also be extended to include the degree of trade openness, trade regimes, and incentives. With regard to economic system, Romers (1994) stated that the all- encompassing communism based on central planning and public ownership of almost all productive resources turned out to be a colossal failure wherever it was put into practice.From Roomer's (1994) comparative study of selected countries vis-à-vis natural resources but diametrically different economic systems, found that that economic factors, including economic systems, policies and institutions rather than exogenous technology played an important role in determining the long-run economic growth performance of countries.

In conclusion, endogenous growth model is relevant to this study because it indigenizes the rate of technological progress vis-à-vis macroeconomic variables such as inflation rate and exchange rate amongst others. This will in turn lead to growth.

2.2 Empirical Literature

A critically reviews of previous studies on macroeconomic aggregates and economic growth in both developed and developing countries using various method of studiesshowed that the relationship between macroeconomic aggregates and economic growth varies. For instance, Umaru and Zubairu (2012) used OLS to investigate the effects of inflation rate fluctuation on the economic growth and development in Nigeria for period from (1970-2010). The study revealed that inflation has a positive impact on overall output level in the economy. Kolawole (2013) empirically examined the growth-effects of macroeconomic stability factors in Nigeria. Using time series data for the period 1980 to 2011 and adopting various econometric techniques such as Granger causality test, and Error Correction Mechanism (ECM). The results revealed that real interest rate has direct and significant effects on Nigeria economic growth while external debt and real exchange rate impact negatively on growth in the country.

Antwi, Mills and Zhao (2013) examined the long-run macroeconomic factors of economic growth in Ghana using Johansen approach to cointegration vectors. The time series properties of the data were first analyzed using the Augmented Dickey Fuller (ADF) test. The empirical results derived indicate that all the variables of were stationary after their first differencing. The study found cointegration relationship between real GDP per capita (economic growth) and its macroeconomic factors. Muhammad, Muhammad, Umar and Saima (2014) used correlation and granger causality tests to investigate the impact of macroeconomic variables on GDP growth of Pakistan from1980 to 2013. From the result of correlation coefficient, inflation, FDI and interest rate have negative association with GDP growth. The result of Granger causality test indicated that inflation, interest rate, exchange rate and FDI demonstrate significant impact on GDP growth.

Ismaila and Imuoghele (2015) used cointgration and OLS to examine the macroeconomics determinants of economic growth in Nigeria from 1986 to 2012. The cointegration result showed the existence of long run relationship among the variables. Ordinary Least Square results showed that gross fixed capital formation, foreign direct investment and total government expenditure are the main determinants of Nigeria economic growth.Muhammad, Muhammad and Rashid (2015) examined the impact of major economic variables on economic growth of Pakistan. The secondary data on GDP, inflation rate, interest rate and exchange rate from 1981 to 2013 was used. The results of the OLS multiple linear regression describe that both inflation rate and interest rate spread negative impact on Pakistan's economicgrowth while exchange rate is found positively significant on the economy. Therefore, all selected variables having less impact on economic growth of the country as compared to other factors that put a serious impact on Pakistan's economic conditions.

In summary, the review of literature shows that literature on these variables is sparsely available and scattered. Thus, one is not sure of the exact correlation between some of these variables especially exchange rate, inflation rate, Balance of Payments and GDP. Therefore, the current study examined the long run relationship as well as the behaviour of the exchange rate, inflation rate, Balance of Payments and GDP over the period of military regime and sustained democracy in Nigeria. Thus, the

econometric methods of unit root test co-integration test and chow test was used in analyzing the time series data generated for the study.

3.0 METHODOLOGY

The study used secondary data collected from CBN statistical bulletin and applied a three stage methodical process to examine the impact of selected macroeconomic aggregates on economic growth in Nigeria. One was to check the stationary status of the variables using Augmented Dickey Fuller Unit Root test, which confirmed that the variables had no unit root problems, the second was to check for the possibility of a long run relationship using Johansen co-integration test; the third was the chow result, which tested the statistical significance of the macroeconomic aggregates on economic growth over two distinct periods of unstable democracy/military rule and sustained democracy rule.

The ADF Unit Root Test

Unit root test involves testing the order of integration of the individual series under consideration (Dickey and Fuller, 1979). Thus, the Augmented Dickey-Fuller test relies on rejecting a null hypothesis of unit root (the series are non-stationary) in favour of the alternative hypothesis of stationarity. The tests are conducted with and without a deterministic trend (t) for each of the series. The general form of ADF is estimated by the following regression

$$\Delta X_t = \alpha_0 + \alpha_1 X_{t-1} + \Sigma \alpha_1 \Delta X_i + \delta_t + U_t \qquad (3.1)$$

Where: X is a time series, t is a linear time trend, Δ is the first difference operator, α_0 is a constant, t-1 is the optimum number of lags in the independent variables and U is random error term

The Co-integration Test

Co-integration is an econometric technique for testing correlation between non-stationary time series variables. Thus, the absence of co-integration among variables proposes that such variable does not have long-run relationship. Thus, Johansen (1988) general form of co-integration is given by

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$$GDP_t = \mu + \Delta_1 GDP_{t-1} + - - - + \Delta q\, GDP_{t-q} + U_t \qquad (3.2)$$

Where: Δ is the changes in the different operator, Y_t is the vector of variables that are integrated, t-1 is the lag length, t-p is the number of cointegrating equation and U_t is the error term.

The Chow Test

The following structural break model was formulated to compare the economic growth performance of Nigeria vis-à-vis period of unstained democracy/military rule and sustained democracy rule. Suppose that we model our data as;

$$Qd_t = c + q\beta_{1t} + P\beta_{2t} + U \qquad (3.3)$$

If the data is splits into two groups, then theequation becomes;

$$Qd_t = c_1 + q_1\beta_{1t} + P_1\beta_{2t} + U \qquad (3.4) \text{ and}$$

$$Qd_t = c_2 + q_2\beta_{1t} + P_2\beta_{2t} + U \qquad (3.5)$$

The null hypothesis of the Chow test asserts that $c_1 = c_2$, $q_1 = q_2$, and $P_1 = P_2$

4.0 RESULTS AND DISCUSSION

Table 4.1:Augmented Dickey Fuller Unit Root Test at Level and First Difference

Variable	ADF Test @ Level	Critical Value			ADF Test @ 1ST Diff	Critical Value			Order of Integration
		1%	5%	10%		1%	5%	10%	
GDP	-1.3258	-3.6793	-2.9678	-2.6229	-5.2665	-3.6998	-2.9762	-2.6274	1(1)
INF	-2.5853	-3.6617	-2.9604	-2.6192	-4.8812	-3.7529	-2.9980	-2.6387	1(1)
EXR	1.2292	-3.6617	-2.9604	-2.6192	-8.7316	-3.6998	-2.9762	-2.6274	1(1)
BOP	-3.6250	-3.6999	-2.9763	-2.6274	-3.9352	-3.7880	-3.0123	-2.6461	1(1)

Source: Authors' Computed Result Using (E-Views 9.0)

The unit root test of stationarity result presented in Table 4.1 showed that all the variables used for the analysis were stationary at 1%, 5% and 10% levels. Although the variables were not stationary at level. In line with Granger and Newbold (1974), the non-stationary variables were differenced. Therefore BOP was GDP, inflation rate and exchange rate were all stationary at order one. The variables were said to be stationary because each of their respective ADF values were found to be greater than their critical values at 1%, 5% and 10%.

Table 4.2 Johansen Co-integration Test Result

Eigen value	Trace Statistics	5% critical value	Prob. **	Hypothesis of CE(s)
0.916389	96.15331	47.85613	0.0000	None *
0.590663	31.63209	29.79707	0.0304	At most 1 *
0.276309	8.408433	15.49471	0.4228	At most 2
1.00E-05	0.000261	3.841466	0.9891	At most 3

Source: Computed Result Using (E-Views 9.0)

The Johansen co-integration test results as reported in Table 4.2 showed that there are two co-integrating equations at 5% level of significance at lag two. This is because two of the Trace Statistic value is greater than the critical values at 5%. This is strong evidence from the unit root test conducted, where all the variables were stationary at first difference. Therefore, there exists a long-run relationship or equilibrium among the variables. Thus, the null hypothesis of no co-integration was rejected.

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Table 4.3 The Chow Tests Result

Specification: LOG(GDP) C INF LOG(EXR) BOP			
Test predictions for observations from 1999 to 2014			
	Value	Df	Prob
F-statistic	46.72103	(16, 10)	0.0000
Likelihood ratio	129.8246	16	0.0000
Sample: 1985 1998.	**Included Observation:14**		
Variable	Coefficient	t-Statistic	Prob.
C	12.16065	366.2262	0.0000
INF	-0.001831	-2.561081	0.0283
LOG(EXR)	0.147462	8.670170	0.0000
BOP	-2.31E-07	-1.012147	0.3353
Adjusted R-squared	0.891203	DW stat 1.500	
F-statistic	36.49635	Pro(F-sta) 0.0000011	

Source: Computed Result Using (E-Views 9.0)

The chow test is a test that determines if the coefficients from two regression analyses are the same. Here the structural break test was conducted to compare the impact of macroeconomic aggregates on economic growth in Nigeria before and during the era of sustained democratic rule to determine which period command more impact of macroeconomic aggregates on the growth of the economy. This was done by comparing the f-value in the current periods (1985-1998) and lag periods (1999-2014). The results showed that although the two period f-value were statistically significant in explaining the impact of macroeconomic aggregates on economic growth in Nigeria. But the f-stat of 46.7 during the period of sustained democracy is greater than the f-value of 36.5 before the period of sustained democracy. Thus, the study conclude that macroeconomic aggregates vis-à-vis inflation rate, exchange rate and BOP impact more on economic growth in Nigeria during the period of sustained democracy than before the period of sustained democracy.

Meanwhile, the regression coefficient of inflation rate appeared with negative sign and statistically significant at 5% level. Thus, a percentage increase in the rate of inflation will decrease economic growth by 0.001831%. Also, the absolute t-statistic of 2.561081 with the t-prob of 0.03 shows that

there is a significant relationship between inflation rate and economic growth in Nigeria during the period of study. Thus, the alternative hypothesis was accepted.

The regression coefficient of exchange rate appeared with positive sign and statistically significant at 5% level. Thus, a percentage increase in exchange rate will increase economic growth by 0.147462%. Also, the t-statistic of 8.67 with the t-prob of 0.0000 shows that there is a significant relationship between exchange rate and economic growth in Nigeria during the period of study. Thus, the alternative hypothesis was accepted.

Meanwhile, the regression coefficient of BOP appeared with negative sign and statistically not significant at 5% level. Thus, a percentage increase in BOP will decrease economic growth by 0.000000231%. This does not conform to the apriori expectation. Also, the t-statistic of 1.012147with the t-prob of 0.33 shows that there is no significant relationship between BOP and economic growth in Nigeria during the period of study. Thus, the null hypothesis was accepted.

The Adjusted R^2 of 0.891 shows that 89% systematic variation of the dependent variable was caused by the three independent variables (inflation rate, exchange rate and BOP). This shows the good fit of the model. Also, the Durbin Watson of 1.5 showed the presence of lesser serial autocorrelation of the explanatory variables in the model. Thus, the estimated model is fit for police formulation and implementation.

5.0 CONCLUSION AND RECOMMENDATIONS

The study empirically assessed theimpact of selected macroeconomic aggregates on economic growth in Nigeria. This study is essential because it examined the impact of selected macroeconomic variables on economic growth in Nigeria. From the literature study, it was discovered that Nigeria in her quest for growth formulates policies that tends to bring about stability of the macroeconomic variables of the economy to enhanced economic growth. Thus, an augmented growth model was estimated via the ADF unit root test, co-integrated and structural break techniques to establish the relationship between

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the effect of macroeconomic aggregates and economic growth (GDP). The results of the output model showed that variables were stationarity via the ADF unit root test and co-integrated. Meaning that a long run relationship exist amongst the variables. Thus, the alternative hypothesis of long run relationship between macroeconomic variables and gross domestic product was accepted. The Chow Test results show that although the two period f-value were statistically significant in explaining the impact of macroeconomic aggregates on economic growth in Nigeria. But the f-stat of 46.7 during the period of sustained democracy is greater than the f-value of 36.5 before the period of sustained democracy. Thus, the study conclude that selected macroeconomic aggregates vis-à-vis inflation rate, exchange rate and BOP impact more on economic growth in Nigeria after the period of sustained democracy than before the period of sustained democracy.

Based on the findings of the study, it was recommended thatgovernment should formulate and implement a low inflation rate monetary policyin order to achieve economic growth. Also, it is recommended that the government of Nigeria should develop prudent monetary policies that would aim at stabilizing the macroeconomic indicators such as exchange rate and balance of payments, so as to boast the growth of the economy.

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