Effect Of Agriculture Products On Inflation Rate, Exchange Rate And Interest Rate On Gross Domestic Product In Nigeria

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***Abstract*— This paper effect of Agriculture products on inflation rate, exchange rate and interest rate on gross domestic product in Nigeria is aim to identify the role of politics in National Development in Nigeria and determine if agriculture and politics really affect the National Development in Nigeria .Data was collected from abstract of Central Bank of Nigeria. Regression analysis is use to analyze the data .From the result of the analysis R-squared shows how close the data to the fitted regression line. The value of the R(0.735) 73.5% which implies that total variation in agricultural products is explain by explanatory variables. Based on the finding in this research we conclude that government should try to curb the inflation, to reduce the interest in order to improve on Agricultural products and Gross domestic Product in Nigeria.**

***Index Terms*— Agricultural, Inflation and Gross National Products.**

I. INTRODUCTION

Agriculture is the predominant activity in most of the zones in Nigeria, percentage of persons working in agriculture ranges between 24.4 and 85.1 percent across zones in Nigeria. With respect to states, the activity ranges between 2.4 and 91.7 per cent, majority of states having over 50 percent, (CBN,2000).Increases in agricultural output brought about by increase in land and labour productivity, make food cheaper; benefit both rural and urban poor people who spend much of their income on food. Under the right conditions, increase in agricultural productivity causes the incomes of both small and large farmers to increase and generate employment opportunities.

The foundation of these potential was laid by agricultural sector that effectively and efficiently played its traditional role. But in an economy like Nigeria, the agricultural sector had suffered setbacks attributed to widespread poverty and food insecurity. In the Nigerian economy and many developing countries, agriculture is practiced at subsistence level. Almost all rural dwellers depend on income from agricultural output for survival. About 70% of the total labour force is employed by the agricultural sector, therefore, agricultural transformation means a lot in reducing Unemployment and aiding national growth. Invariably, every increase in income or per capita agricultural output enhances the incomes of the poor and reduces the number of people living on less than US$1 a day in this area, leading to increase in capital formation.

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It is with this quest for recent empirical-econometric facts that motivated this study, poised with the aim of finding out how agricultural output can help to reduce, if not eliminate unemployment and enhance developmental growth. It is equally aimed at providing policy information for the government.

II. AGRICULTURE AND NATIONAL DEVELOPMENT

Agriculture still remains the mainstay of Nigeria's economy. It may not be an over statement to assert the significant contributions agriculture have made to the national economy. The importance of agriculture is clearly seen in the New Agricultural Policy of 2004, which seeks to attain self-sustaining growth in all the sub-sectors and the transformation of the socio-economic development of the nation. The policy also recognized agriculture as a vital sector that could achieve the poverty reduction goals of the government. Agriculture provides food security and farm products for domestic consumption and raw materials for local industries and international markets. Increasing production above subsistence levels facilitate the growth of the non- farm economy. By stimulating growth of industries and widening employment opportunities, agriculture provides increased income outlets for various segments of the population. And increase in income leads to capital formation leading to the growth of non farm sector. It contributes to foreign exchange earnings through export of farm produce which accelerate the development of other sectors of the economy and ensure favorable balance of payment and trade. The industrial expansion which is a bye- product of capital formation acts as catalyst for establishing more industries and accelerating jobs for the population in both agricultural and non agricultural sectors. This scenario encourages the establishment of allied industries such as banks, insurance and service sectors. On the whole, all these will have a multiplier effect in terms of achieving greater integration and linkages in the various sectors of the economy. Invariably, it will lead to further employment and income generation opportunities for the masses, thereby reducing the extent of unemployment and enhancing living standards of the citizens.

The new agricultural policy is aimed at achieving the following broad objectives:

- Attainment of food security in basic food commodities.
- Increase in production of agricultural raw materials to meet the growth of an expanding industrial sector, increase in production and processing of exportable commodities to increase their foreign exchange

capacity and further diversify the country' s export base and sources of foreign exchange.

- Modernization of agricultural production, processing, storage and distribution through the infusion of improved technologies and management so that agriculture can be more responsive to the demands of other sectors of the Nigerian economy.
- Creation of more agricultural and rural employment opportunities to increase the income of farmers and rural dwellers and to absorb productively an increasing labour force in the nation.
- Protection and improvement of agricultural land resources and preservation of the environment for sustainable agricultural production.
- The release of Nigeria' s National Economic Empowerment and Development Strategy (NEEDS) provides an ideal platform for the international community to support Nigeria' s efforts to revitalize agriculture as an engine for reducing poverty and employment creation.

III. Methodology and Analysis of Data

A. Regression Analysis

Regression is a procedure which selects, from a certain class of functions, the one which best fits a given set of empirical data (usually presented as a table of ***x***and ***y***values with, inevitably, some random component). The *' independent'* variable ***x***is usually called the *regressor* (there may be one or more of these), the *'dependent'* variable ***y***is the *response* variable. The random components (called *residuals*) are usually assumed *normally* distributed, with the same σ and independent of each other.
The class from which the functions are selected (the *model*) is usually one of the following types:

- a linear function of x(i.e. $y = a+b\ x$) ;a simple (univariate) linear regression,
- a linear function of $x_1, x_2, ..., x_k$; a multiple (multivariate) linear regression,
- a polynomial function of x;a polynomial regression,
- any other type of function, with one or more parameters *(e.g.* $y = a\ e^{bx}$*)*; a nonlinear regression.

The coefficients (parameters) of these models are called regression coefficients (parameters). Our main task is going to be to find good estimators of the regression coefficients (they should have correct expected values and variances as small as possible), to be used for predicting values of ***y***when new observations are taken.

Linear regression is an approach to modelling the relationship between a scalar dependent variable ***y*** and one or more explanatory variables denoted x. The case of one explanatory variable is called simple regression. More than one explanatory variable is multiple regressions.
The linear regression model, with infinite response variables, is given by:

$$y_i = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + \ldots + \varepsilon_i$$

B. Coefficient of Determination (R^2)

A measure used in statistical model analysis to assess how well a model explains and predicts future outcomes. It is indicative of the level of explained variability in the model. The coefficient, also commonly known as R-square, is used as a guideline to measure the accuracy of the model. One use of the coefficient of determination is to test the goodness of fit of the model. It is expressed as a value between zero and one. A value of one indicates a perfect fit, and therefore, a very reliable model for future forecasts.

C. Model Specification

This study is aimed at establishing the dynamics properties of the relationship of GDP and other variables of interest over the years (1985-2015). The functional form, on which our model was based, employed a multiple regression equation in the analysis of this work. In an attempt to capture essence of this study, and based on previous studies. Gross Domestic Product (GDP), Inflation Rate (Inf .Rate), Exchange Rate (Ex. Rate) and Interest Rate (Int. Rate) were used to formulate the model. Thus, the model is represented in a functional form shown below:

GDP = F (Inf. Rate, Ex. Rate and Int. Rate) (1)

Where GDP = Gross Domestic Product (Dependent variable)
INF.RATE: Inflation Rate (First Independent variable)
EX.RATE: Exchange Rate (Second Independent variable)
INT. RATE: Interest Rate (Third Independent variable)
In a linear function, it is represented as follows,

$$GDP = \beta + \beta_1 Inf.R + \beta_2 Ex.R + \beta_3 Int.R + \mu \quad (2)$$

Where β_0 = Constant term, β_1 = Regression coefficient of Inf. R, β_2 = Regression coefficient of Ex. R, β_3 = Regression coefficient of Int. R and μ = Error Term.
Inf. Rate, Ex. Rate and Int. Rate is represented by X_1, X_2 AND X_3 respectively

$$GDP = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \mu$$

D. Coefficient of multiple determination (R^2) and Correlation Coefficient (r)

Coefficient of multiple determination (R^2) measures the percentage change in the dependent variation as explained by changes in the independent variation. It measures the goodness of fit of the regression plan. While Correlation coefficient (r) simply refers to the statistical measure which determines the amount of linear relationship between two variables. It also measures the strength or the degree of association among variables

IV. PRESENTATION OF DATA

The project data to be analyzed are presented below

Year	Gross domestic product	Inflation rate	Exchange rate	Interest rate
1985	67908.55	5.50	0.89	9.25
1986	69146.99	5.40	2.02	10.50
1987	105222.84	10.20	4.01	17.50
1988	139085.30	38.30	4.53	16.50
1989	216797.54	40.90	7.40	26.80
1990	267549.99	7.50	8.03	25.50
1991	312139.74	13.00	9.90	20.01
1992	5326123.83	44.50	17.30	29.80
1993	638869.79	57.20	22.05	18.32
1994	899863.22	57.00	21.89	21.00
1995	1933211.55	72.80	21.89	20.18
1996	2702719.13	29.30	21.89	19.74
1997	2801972.58	8.50	21.89	13.54
1998	2708430.86	10.00	21.89	18.29
1999	3194014.97	6.60	92.70	21.32
2000	4582127.29	6.90	102.10	17.98
2001	4725806.00	18.90	111.94	18.29
2002	6912381.25	12.90	120.98	24.85
2003	8487031.57	14.00	129.35	20.71
2004	11411066.91	15.00	133.50	19.18
2005	14572239.12	17.90	132.14	17.95
2006	18564594.73	8.20	128.65	17.26
2007	20657317.67	5.40	125.83	16.94
2008	2429632.29	5.90	121.90	15.14
2009	24794238.66	10.60	150.01	18.98
2010	29205782.96	15.30	162.01	17.92
2011	16604335.72	14.00	152.60	21.10
2012	17324743.49	9.80	158.79	21.31
2013	18045151.26	16.20	164.98	21.53
2014	18765559.04	13.70	171.17	21.74
2015	21867143.00	12.60	177.90	21.84

Source: Central Bank Of Nigeria Bi-Annual Statistics Bulletin. Bulletin Of December 2010,Volume 20.

V. ANALYSIS

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.857[a]	.735	.705	4817804.12477	1.585

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	-557514.345	4196138.924		-.133	.895
	INF	25482.484	59763.410	.051	.426	.673
	EX	119039.194	15296.189	.880	7.782	.000
	INT	-63246.158	231853.141	-.030	-.273	.787

Hypothesis for joint test (F-test)

H_0: $\beta_0 = \beta_1 = \beta_2 = \beta_3 = 0$

H_1: $\beta_1 \neq 0$ for at least β_i

Test Statistic

$$F = \frac{MSR}{MSE}$$

Testing for the contribution of the explanatory variables.

Hypothesis One:

H0: $\beta 1 = 0$ Vs H1: $\beta 1 \neq 0$

Test Statistic: P value = 0.673, $\alpha = 0.05$

Decision Rule: Reject H0, if P value < α, otherwise do not reject H0

Decision: Do not reject

Conclusion: Inflation rate has no significant impact on economic growth in Nigeria.

Hypothesis Two:

H0: $\beta 2 = 0$ Vs H1: $\beta 2 \neq 0$

Test Statistic: P value = 0.00, $\alpha = 0.05$

Decision Rule: Reject H0 if P value < α, otherwise do not reject H0.

Decision: Reject H0

Conclusion: Exchange rate has significant impact on economic growth in Nigeria.

Hypothesis Three:

H0: B3 = 0 Vs H1: B3 ≠ 0

Test Statistic: P value = 0.787, $\alpha = 0.05$

Decision Rule: Reject H_0 if P value < α, otherwise do not reject H_0

Decision: Do not reject H_0.

Conclusion: Interest rate has no significant impact in economic growth in Nigeria.

The model is $Y = -557514.345 + 25482.484X_1 + 119039.194X_2 + -63246.158X_3$

Time Plot

The below time plot in figure 1 shows the behaviour of Nigeria gross domestic Product rate. The plot reveals that Nigeria GDP is grossly characterized with trend variation as the observations shows an upward and downward movement.

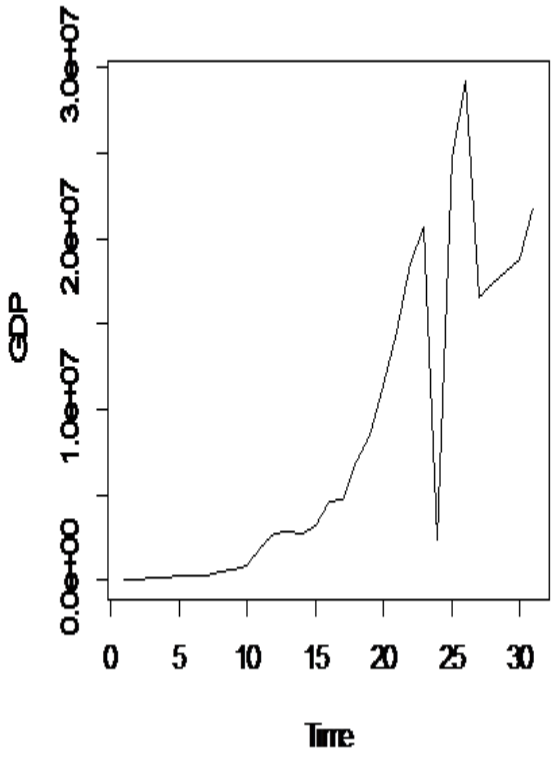

Figure 1: Time plot of Nigeria Gross Domestic Product.

VI. SUMMARY

This research effect of Agriculture products on inflation rate, exchange rate and interest rate on gross domestic product in Nigeria is aim to study how the variables of interest such as Inflation Rate, Exchange Rate as well as Interest Rate affect standard of living (GDP) in Nigeria.. R=0.735(73.5%) which implies that 73.5% of the total variation in Agriculture is explained by the explanatory variables in the regression equation. The goodness of fit in the regression remain high from the analysis it was discovered that β1 β 2 and β3 are not necessary in the equation and this mean that only exchange rate contribute extensively to Agricultural product in Nigeria

VII. CONCLUSION

Based on the finding in this research we conclude that government should try to curb the inflation, to reduce the interest in order to improve on Gross domestic Product in Nigeria.

REFERENCES

[1] Abayomi, Y O. (1997). The Agricultural Sector in Nigeria: The Way Forward. Central Bank of Nigeria Bullion Vol. 21, No. 3.
[2] Adebayo, A. (1999). Economics: A Simplified Approach 2nd ed. Lagos: International Publishing Limited.
[3] Babajide, A.R. (1999). Policy Recommendation on Agriculture; www.google.com, October.
[4] Central Bank of Nigeria, (2000). The Changing Structure of the Nigerian Economy and Implications for Development, Lagos: Realm Communications Ltd, August.
[5] Christiansen, L., Demery, L. and Kuhl, .J (2006). The Role of Agriculture in Poverty Reduction: An Empirical Perspective, World Bank Policy Research working paper 4013, September.
[6] Ihimodu, Ifeyori I. (2007). Reforms in the Agricultural Sector. In Hassan et.al (eds) Nigeria' s Reforms Programmes: Issues and Challenges. Ibadan: Vantage Publishers Limited.
[7] Ogen, O. (2007). The Agricultural Sector and Nigeria' s Development: A Comparative Perspective from the Brazilian Agro-industrial Economy 1960 – 1995. Nebula, March
[8] Ogunfiditimi, T. O. (1996) Agriculture and Nigeria' s Economic Development: Policies, Problems and Prospects. Central Bank of Nigeria Economic and Financial Review. Vol.34, No.4 pp.903-927.
[9] Ogwumike, F.O. (2002). An Appraisal of Poverty Reduction Strategies in Nigeria. CBN Economic & Financial Review, Vol. 39, No. 4.
[10] World Bank, (1996). " Nigeria Poverty in the Midst of Plenty, the Challenge of Growth with Inclusion"
[11] A World Bank Poverty Assessment Handbook World Bank, (1996). Nigeria: Targeting Co