
Macroeconomic Variables and Per Capital Income Nexus in Nigeria: 1986-2018

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Abstract: *This study investigated the effect of macroeconomic variables in Nigeria using money supply, government expenditure, inflation rate, exchange rate and interest rate as measure for macroeconomic variables' (the independent variables) and per capita income as (the dependent) proxy for human capital development the dependent variables for period 1986-2018. The data used for the study was sourced from Central Bank of Nigeria (CBN) statistical bulletin and World bank Development Indicator. The data were analyzed with econometrics techniques involving descriptive statistics, augmented Dickey, Fuller and Philip Peron tests for unit root. The Autogressive Distributive Lag (ARDL) was used to determine the effect of relationship between macroeconomic variables and per capita income. The result obtained indicated that macroeconomic variables had a significant long run and short run effect on per capita income in Nigeria. The study made some of the following recommendations: (a) that relevant policy instrument be put in place to increase per capita income through the creation of favourable socio-economic environment, (b) government should increase the education budget to accommodate the poor children in the streets whose parents cannot afford school fees thus investing their living standard. Finally, private sector investment should be encouraged by the government at all levels to create employment opportunities so as to improve the quilt of life and standard of living of Nigeria people.*

Keywords: *Macroeconomic Variables, Standard of Living, Per Capita Income Policy Instruments*

INTRODUCTION

Macroeconomics variables are main sign poses signaling the current trends in the economy. These macroeconomic variables affect the aggregate performance structure, behavior and decision-making process of an economy as a whole (O'Sulhvia and Sheffrin, 2003). Like all experts, the government, in order to manage the economic aggregates must do analysis and understand the major economy (Bevharden, 2009). In today's world, we interpret macroeconomic variables quite differently within the parameters of the global economic crisis and other economic shocks as they occur, and we cannot apply the directly observed macroeconomic variables in crisis situation in the same way as we do in a tranquil period.

Human are the most variable assets in every economy (Ogunlaye, Owolabi, Sanyaolu and Lawal, 2017). To achieve development, it therefore becomes imperative for these assets to be managed properly and effectively used. One, way or doing this is, by ensuring adequate investment is made in human capital. Human capital refers to the abilities and skills of human resources and human capital development refers to the process of acquiring and increasing the number of

persons who have the skills, education and experience which are critical for the economic development of the country (Adelakun, 2011).

Statement of the Problems

Over the years, macroeconomic variables and human capital development have attracted significant attention from finance and development experts and have been debated extensively. Several studies carried out on macroeconomic variables and human capital development nexus are with mixed findings. For instance, Fabiyi, Adeyi and Isiaka (2018) revealed unemployment as negatively related to GDP, capital formation and export. Also, public health expenditures and growth engenders good health outcomes like reduces mortality rate Okeke (2015), Oluwatoyin, Adegboya and Fagbeminiyi (2018), Onisanwa (2014) but no effect on education, (Okeke, 2015).

Moreso, empirical studies in Nigeria are few that employed time series data and focused on the effect of macroeconomic variables on human capital development. In addition, most of the studies did not consider the short run studies on human capital development. Also, a good number of the extent studies used panel and cross-sectional data as well as lack consensus on their findings on macroeconomic variables and human capital development nexus. The study therefore compliment the existing empirical studies by using annual data for the year 2018, and Auto Distributive Lag Model (ARDL) that is capable of reporting both, long run effect and short run shocks of macroeconomic variables on human capital development dynamics proxy by per capita income in Nigeria.

Objective of the Study

The main objective of the study is to investigate the effect of macroeconomic variables on per capita income in Nigeria. However, other specific objectives are:

- (i) Evaluate the effect of interest rate on per capita income in Nigeria as a measure of human capital development.
- (ii) Analyze the effect of inflation on per capita income in Nigeria as a measure of human capital development.
- (iii) Determine the effect of government expenditure on per capita development.
- (iv) Ascertain the effect of money supply on per capita income in Nigeria as a measure of human capital development.
- (v) Examine the effect of exchange rate on per capita income in Nigeria as a measure of human capital development.

Research Questions

The following research questions are raised in the course of this study:

- i) How does interest rate affect per capital income in Nigeria as a measure for human capital development?
- ii) What are the effects of inflation rate affect per capital income in Nigeria as a measure for human capital development?
- iii) How does money supply affect per capital income in Nigeria as a measure for human capital development?
- iv) What are the effects of exchange rate on per capital income in Nigeria as a measure for human capital development?

Research Hypotheses

The following are the research hypotheses for the study stated in their null form.

Ho₁: Interest rate has no significant effect on per capital income in Nigeria

Ho₂: Inflation rate has no significant effect on per capital income in Nigeria

Ho₃: Government expenditure has no significant effect on per capital income in Nigeria

Ho₄: Money supply has no significant effect on per capital income in Nigeria

Ho₅: Exchange rate has no significant effect on per capital income in Nigeria

Significance of the Study

Findings from the study will be of immense benefits in a number of ways and to different groups of persons.

Public: The understanding of the study will enhance the ability of the public to see reasons while unemployment remains abated despite government various grant policies and programmes towards reducing unemployment.

Government: It would also be of paramount significance to the government for policy formulation purpose in the quest for sustainable investment growth and reducing unemployment in Nigeria.. Government will definitely find this research work useful as it tends to proffer solutions or recommendation that is capable of helping her in nation building.

Academics/Future Research: Both academic and other future researchers in this subject matter will find it useful source of research material.

LITERATURE REVIEW

Conceptual Framework

Macroeconomic variables: macroeconomic variables are factors that are pertinent to broad economy of the regional or national level and affect a large population rather than a few selected individuals. The following macroeconomic variables such as inflation, money supply, government expenditure, exchange rate and interest rates are employed in this study as proxy for macroeconomic variables and are deeply explained.

Interest Rate

Interest rate is the charge a borrower pays for the money lend to him for business or other transaction motives. Investors borrow money from banks and other financial institutions. The response of investment expenses changes keenly with interest rate which is at the mind of money-making analysis Acha, and Acha, (2011). Interest rate is the other strong factors that affect financial policies as well as weaker financial payments in guiding principles of investors. It facilitates investment if the high interest rate is applicable on savings. The negative influence of higher investment rate inhibits the macroeconomic effect of interest rate policy. In New York, borrow and cash offers money as a guarantee to the lender of collateral. This is the most common form of investment in business performance. This program takes the type of customized term loan of a portfolio of securities. Because the transaction is customized, it is difficult to make general statement regarding its use. That said borrowers may negotiate an annual free for rights to borrow securities from beneficial owners entire portfolio.

The net result is a government spending on GNP which has been the remains to single significant source of difference in excess of stabilization interest rate policy. The purpose of interest rate is in response to money investment to look forward in narrowing the divergence concerning the effects of cost and interest rates in the commercial banks. The reactions of interest rates depend on the fundamental substitutability of capital for other factors in investment to take place.

Inflation

It is the persistent increase in the general price level within the economy which affects the value of the domestic currency (Fatukasi, 2012). It is not once and for all upward price movement but has to be sustained over time and affect all goods and services within the economy. Several factors are responsible for inflation in Nigeria. The inflation which results from excess aggregate demand is called the demand fall inflation, the cost push inflation results from upward movement in the cost of production while the structure inflation arises from some constraints such as inefficient production, marketing and distribution systems in the productive sectors of the economy. Other forms of inflation in developing country could be imported, open and seasonal inflation. The imported inflation comes as a result of transmission of inflation through internationally traded goods and services. This is when the economy imports goods from countries already, experiencing inflation. The open inflation comes as a result of uninterrupted market mechanisms and seasonal inflation is associated off season in production when supply constraints permeates the economy as a result of fall in production especially farming produce. In Nigeria, other factors can be attributed to inflation such as the nature of the economy, its history, and fiscal and monetary policy direction. Inflation is defined as a generalized increase in the level of price sustained over a long period in an economy (Lipsey and Chrystal, 2015), that is, a persistent rise in the price levels of commodities and services, leading to a fall in the currency's purchasing power. Although inflation is a household word in many market-oriented economies, and there exist a compendium of empirical studies on the over-arching problem of inflation, yet only selected few seem to know about the determinants, mechanics, and the real impact of inflation on national economic growth.

Government Expenditure

Government expenditure is the total in cash terms of the federal, state and the local government spending including transfers to the parastatals and the three levels of the government (Anyato, 2016). In as much as public expenditure is highly desirable it however talks from of allocation stabilization of resources (Musgrave and Musgrave 1989) The allocation function becomes necessary so as to provide both private and in particular social goods in appropriate mix with available resources. The provision of social and physical infrastructure through public investment and expenditure on some goods and services theoretical can directly improve productivity in the private sector through more efficient allocation of resources due to the special characteristics of social goods. Kellick (2009), it is the responsibility of the state through expenditure to provide the desirable services which the price mechanism cannot provide or produce at all or would only do so at high cost and with smaller social bereft. The recurrent expenditure is government expenditure made regularly from year to year. Some examples includes personnel cost overhead cost utility services telephones, furniture and equipment.

On the other hand capital expenditures are spend on new construction, land and balding acquisition, fixed assets which have expected working life more than one year. This divides total expenditure into transfer and non- transfer expenditure. Generally, there is certain expenditure which does not result in corresponding of the transfer of real resources to the government, the payment on debt and unemployment benefit are example of this expenditure. Here the governments usually transfer additional financial resources to some sections of the society.

Money Supply

Money is a collection of liquid assets that is generally accepted as a medium of exchange and for repayment of debt. In that role, it serves to economize on the use of scarce resources devoted to exchange, expands resources for production, facilitates trade, promotes specialization, and contributes to a society's welfare (Singh et al 2011).The supply of money at any moment is the total amount of money in the economy at a point in time (Jhingan,

2006). In Nigeria, the narrow money supply (M1) is defined as currency outside bank plus demand deposits of commercial banks plus domestic deposits with the central banks less Federal Government deposits at commercial banks. In simple terms, M1 is defined as;

$$M1 = C+D$$

Where:

M1	=	Narrow money supply
C	=	Currency outside banks
D	=	Demand deposits.

Exchange Rate

Conceptually, an exchange rate implies the price of one currency in terms of another. Exchange rate is the ratio between a unit of one currency and the amount of another currency for which that unit can be exchanged at a particular time (Ngerebo-a and Ibe, 2013). In other words, exchange rate is the price of one currency vis-à-vis another and is the number of units of a currency required to buy another currency (Mordi, 2006). Exchange rate of currency is the link between domestic and foreign prices of goods and services. Also, exchange rate can either appreciate or depreciate. Appreciation in the exchange rate occurs if less unit of domestic currency exchanges for a unit of foreign currency while depreciation in exchange rate occurs if more unit of domestic currency exchanges for a unit of foreign currency.

Empirical Studies

Bernadette (2019) assessed the impact of inflation/high cost of living among underclass single mother in Githurai 44 (Soweto Slum) for two years (2010-2011). The objective of the study were to assess how the single mothers current economic status has been affected by inflation, to identify social economic challenges faced by single mothers and to assess the livelihood strategies among single mothers in the area. The target population was underclass single mothers in the slum. The study was based on a sample of 130 female headed households who were single mothers. Data was collected from 8 focused group discussion, interview and non-participation observation. Data collected was analyzed both qualitatively and quantitatively. The findings showed that majority of single mothers had low education level and low paying jobs. They

earned less than a dollar, had limited disposable income, struggled to purchase essential commodities and lived in abject poverty.

Khalid Ali and Sangui (2015), studied and analyze the impact of inflation on per capita income of emerging economic. In order to achieve the objective of the study, the researchers took five major emerging economics of the world for the period 1999 to 2011. After employing the regression model, the result confirmed that independent variables (inflation) do not statistically influence the dependent variable (per capita income) in three countries which are Brazil, India and South Africa. However, in the two countries (Ettina and Russia), the findings affirmed the independent variable (inflation) to statistically influence the dependent variable (per capita income). Therefore, it can be concluded that a change in inflation cannot necessarily bring a change in the per capita income of the country.

Fagbohun and Adekoya (2016), investigated the impact of investment on long-run per capital income growth in Nigeria for the period 1970-2014. It also finds out other macroeconomic determinants of long-run output per capita growth. The study employs Ordinary Least Square (OLS) estimation techniques to establish the link based on the sourced data from the central Bank of Nigeria (CBN) Bulletin. Empirical findings revealed that openness of trade has positive and significant impact on growth rate of per capita income in Nigeria.

Salam and Ibrahim (2019), investigated the effect of government expenditure on per capita income in Nigeria using Vector Error Correction Model for its analysis for the period 1986 to 2017. The data were diagnosed with unit root test for stationary in which Per Capital Income (PCI), Population (POP) and Government Expenditure (GEX) were stationery at second difference while investment (INV) was stationery at first difference. The result of VEC model shows that GEX posits negative relationship in the short-run and 0.85 percent of adjustment recommends that government should inject more funds into the economy but ensure all loopholes or leakages are blocked as well as to ensure proper guidelines of policy implementation of fund appropriation so much so that the purpose are achieved.

Zakaria (2016), examines the dynamic interactions between inflation and standard of living of in Somaliland to see how the inflation affect standard of living. Somaliland people have been wakened by uncontrollable inflation and they need a long-term solution which at least reduces the inflation or the rising prices of commodities. The researcher use a sample size of 96 respondents which will be a mixed people of all stages of population like low, middle and high income households and also include some economist and institutions. This made it easy to gather a reliable information and accurate data. The researcher summarized the findings of the study and confirmed that inflation hurts the standard of living and d purchasing power of society.

Research Methodology

The Search Design and Sources of Data

Their study use the ex-post facto research design to examine macroeconomic variables nexus and per capita income in Nigeria. The data for the study was generated from the official publication of Central Bank of Nigeria (CBN) statistical bulletin and Annual Report and accounts. The time frame is expected to cover thirty two years from 1986-2018.

Model Specification

The model used in this study is a modification of the model used by Ndugbu, Duruechi and Ojiegbe (2017), who studied the effect of macroeconomic variables and per capita income in Nigeria.

His model specified that:

PCI = f(EXR, INT, INF, RGDP, TOP) where:
PCI = Per Capita Income
EXR = Exchange Rate
INT = Interest Rate
INF = Inflation Rate
RGDP = Real Gross Domestic Product
TOP = Trade Openness

The above model is modified in line with the objective of the study as follows:

PCI = f(MS, EXR, INF, GOV, INT) where;
PCI = Per Capital Income
MS = Money Supply
EXR = Exchange Rate
INF = Inflation Rate
GOV = Government Expenditure
INT = Interest Rate

The relationship can be formulated into of model equation thus:

$IPCF = f_0 + \alpha_1 MS + \alpha_2 EXR + \alpha_3 INF + \alpha_4 GOV + \alpha_5 INT + P$. where f_0 is a constant or intercept, $\alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5$ are the coefficients of explanatory variable and P is statistic error term.

Method of Data Analysis

The multiple regression model was employed in the study for the purpose of analyzing data and drawing conclusions. The following analytical techniques' and steps shall be followed: (1) Diagnostic/Standard Tests (2) Test for Stationarity (unit root) and (3) Regression Analysis.

Data Presentation and Analysis

The logged data for this study was presented in the appendix. The data was logged to present the data in the same base before it was used for the analysis to other reason is to achieve normality.

**Table 1: Descriptive Statistics
Macroeconomic Variables and Per Capital Income**

	PCI	LMS	INF	EXR	LGOVT	INT
Mean	12.86579	6.547237	68.07474	90.09474	11.67463	17.61579
Median	93.70000	6.611111	70.18000	97.40000	11.81725	17.68500
Maximum	32.23000	10.12982	85.66000	360.5000	14.53615	29.80000
Minimum	26.20000	2.672078	37.97000	0.610000	8.431766	7.750000
Std. Dev.	88.41544	2.555846	12.61960	91.21405	2.287401	4.626646
Observations	32	32	32	32	32	32

The summary statistics show that the average mean of per capita income is about 12.86. The average mean of money supply is 6.54 while average mean of inflation rate, exchange rate, government expenditure and interest rate are 6.547237, 68.07474, 90.09474, 11.67463 and 17.61579 respectively. The standard deviations of macroeconomic variables such as money supply inflation rate, exchange rate, government expenditure and interest rate are 2.21298, 2.555846, 12.61960, 91.21405, 2.287401 and 4.626646. The values of the standard deviations indicate that there is wide spread of capital income in Nigeria. This is also evident in the wide gap between the maximum and minimum values. For example, the maximum value of per capital income 32.2300 while the minimum is 26.2000 with difference of 8.003. Similarly, the maximum of money supply is 10.12982 while the minimum is 2.672078. These performance variations are rather at the high side. Even in the case of inflation rate the maximum is 85.66 and the minimum is 37.97. It is equally observed that exchange rate varied over time. For instance, exchange rate is 360.5 while its minimum value is 0.61. The wide variation over time indicates high level of fluctuation of macroeconomic variables which affects per capita income in Nigeria.

The study conducted some preliminary analysis such as Unit Root Test and Co-integration. The variables for this analysis are subjected to two types of unit root test to determine whether they are unit root or stationery. The tests employed are the Augmented Dickey Fuller (ADF) test and the Philips-Perron Test (PP) test. The null in both the ADF and PP is the presence of unit root.

Table 2: Augmented Dickey Fuller Test (ADF)

Variables	At Level		First Difference		Order of Integration
	t-Statistics	Prob.	t-Statistics	Prob.	
MS	-2.264016	0.1892	-2.425122	0.1437	1(2)
INT	-4.656213	0.0007			1(0)
INF	-4.323464	0.0025			1(0)
EXR	1.753328	0.9995	-4.934566	0.0004	1(1)
GOVT UNE	-2.046787	0.2665	-4.355259	0.0050	1(1)
PCI	-1.811213	0.3685	-5.359893	0.0001	1(1)

Table 3: Philips-Perron Test (PP)

Variables	At Level		First Difference		Order of Integration
	t-Statistics	Prob.	t-Statistics	Prob.	
MS	-2.264016	0.1892	-4.575709	0.0010	1(1)
INT	-4.774825	0.0005			1(0)
INF	-2.775847	0.0730			1(0)
EXR	1.753328	0.9995	-4.927991	0.0004	1(1)
GOVT	-1.995253	0.2873	-3.355259	0.0150	1(1)
PCI	1.785886	0.3804	-5.365306	0.0001	1(1)

The analyses of the stationarity of the variables were performed using the ADF and PP tests. Both tests showed similar result outcomes. The ADF result are shown on Table 2 while the PP results were in Table 3. From both Tables, the results for TNT find INF were integrated at levels. This suggests that the variables are stationary at their level forms. However, MS, EXR, GOVT, and PCI were not stationary in their levels [1(0)], but were found stationary in the first differences 1(1). It is worthy of note that MS was not stationary at 1(0) and 1(1) using the ADF but was found stationary at 1(1) using the Pp. Thus the result of the PP was taken to imply that MS is stationary at 1(1).

These results of Unit root tests (stationarity test) showed that some of the variables (TNT and INF) are stationary at level 1(0) while others including MS, EXR, GOVT, UNE, and PCI are found stationary at first difference 1(1). The stationarity found at level suggests that the variable cannot be affected by changes in time series when they are employed in regression analysis. On the other hand, the variables that are stationary at first difference showed that they respond to changes in time series. Based on the nature of the variables having a combination of 1(0) and 1(1) stationaries, the most suitable tool of analyses is the Autoregressive Distributive Lag (ARDL) technique.

Estimation of the Specified Models

The Autoregressive Distributive Lag (ARDL) technique was used to investigate the effect of macroeconomic variables per capita income in Nigeria. The two forms of regression analysis conducted are the Bound Test and ARDL. Short run regression estimation.

Estimation of Long-Run Effect

The estimation of long-run relationship in the specified models are shown on Table 4. The analysis is the Bound Test to determine the long-run relationship between macroeconomic variables and per capital income. The ARDL results compared the bound critical values with F-statistics values. The decision rule is: if the F-statistic is above the upper and lower critical bound values, then there is a long-run relationship in the model; but where the F-statistics is below the upper and lower bound critical values; it is inferred that there is no long-run effect (relationship). The null hypothesis is that “No long-run relationship exists”.

Table 4: ARDL Bounds Test for Long-Run Effect of Macroeconomic Variables on per Capita Income

Models	F-Statistics	Lower Capital Value Bound at 5% Level	Upper Critical Value Bound at 5% Level
Model 4: Per Capita Income	4.1869*	2.62	3.79

*Significant at 5%

Source: Extracts from Eviews 9 Output on Appendix

From the results in Table 4, the critical bound values were computed at 5% level of significance. The lower critical bound value is 2.62 while the upper critical value is 3.79. The F-statistics is 4.1869. The results showed that per capita income have F-statistics greater than the upper (3.70) and lower (2.62) critical bound value. This model with F-statistics that fall outside the critical values, suggest rejection of the null hypothesis. The results are summarized as following:

- 1 Macroeconomic variables (money supply, exchange rate, inflation rate, government expenditure and interest rate) have significant long-run effect on per capita income in Nigeria.

Since a long-run relationship is found, further analyses have been carried out to determine and explain the nature of the long-run relationship that exist.

Analyses of ARDL Long Run Coefficients and Error Correction

Four out of the five models proved to have long-run relationships in a macroeconomic variables and human capita development nexus. Thus, healthcare, unemployment, per capita income and human development index receives long-run macroeconomic shocks within the periods under study. This section explained the nature of the relationship as well as the speed of adjustment to long-run equilibrium. The results from cointEq (-1) from the cointegrating form is used to explain the sped of adjustment. The nature of the relationship is explained by the long-run.

Table 5: Model of the Long-Run Relationship between Macroeconomic Variables and Per Capita Income in Nigeria

Variables	Coefficient	Std. Error	t-Statistic	Prob.
D(LMS)	1.016698	0.373510	2.722011	0.0346
D(LMS(-1))	0.654865	0.363843	1.799855	0.1220
D(INF)	0.005507	0.007450	0.739225	0.4877
D(INF)	-0.005479	0.004084	-1.341724	0.2282
D(INF)	-0.012971	0.003057	-4.242489	0.0054
D(EXR)	-0.006482	0.001271	-5.100220	0.0022
D(EXR(-1))	-0.004499	0.002866	-1.569856	0.1675
D(EXR(-2))	-0.007921	0.002457	-3.223961	0.0180
D(EXR(-3))	0.006323	0.003638	1.738115	0.1329
D(LGOVT)	-0.244372	0.117591	-2.078159	0.0829
D(LOGVT(-1))	-0.280580	0.436709	-0.642488	0.5443
D(LOGVT(-2))	-0.0918845	0.292872	-3.137362	0.0201
D(INT)	-0.008896	0.018561	-0.479275	0.6487

D(INT)(-1))	0.017572	0.018019	0.975187	0.3671
D(INT)(-2))	0.042138	0.030485	1.382258	0.2161
D(INT)(-3))	0.023027	0.010858	2.120715	0.0782
CointEq(-1)	-0.237613	0.227087	-5.449955	0.0016
Long-Run Coefficients				
Variables	Coefficient	Std. Error	t-Statistic	Prob.
LMS	0.256753	0.354019	9.725251	0.0000
INF	0.025109	0.007996	3.140324	0.0201
EXR	-0.000994	0.002404	-3.413508	0.0306
LGOVT	0.079141	0.288740	0.274089	0.7932
INT	-0.076200	0.068820	-7.107231	0.0006
C	5.478938	1.431600	3.827143	p.0087

Table 5 has a coefficient error correction of -0.23761.3 and the corresponding probability value of 0.0016. The coefficient is rightly signed (negative) with p.value less than 0.05 level, indicating a statistically significant speed of adjustment. This means that changes in per capita income (as a measure of standard of living) will eventually return on a growing normal trend over time. The coefficient indicates about 24% of the deviations of the standard of living in Nigeria due to macroeconomic instability can be corrected within a year. This implies that the selected macroeconomic variables (MS, INF, EXR, GOVT and INT) can be used to stabilize the standard of living (per capita income) in Nigeria.

The nature of the long-run relationship is explained by the coefficient of the long-run models. $LPCI = 0.2568LMS + 0.0251INF - 0.0010EXR + 0.0781LGOVT - 0.9762INT + 6.4789$. The results show the coefficients indicate that money supply (MS), Inflation Rate and Government Expenditure (GOVT) have a positive relationship with per capita income while Exchange Rate and Interest Rate show a negative relationship in Nigeria. The probability values for MS, INF, EXR and INT are less than 0.05 while that of GOVT is greater than 0.05. This study shows that money supply (MS) and Inflation Rate have a statistically significant positive relationship with per capita income while Exchange Rate and Interest Rate had a negative and significant effect. However, Government Expenditure was positive but not significant on long-run per capita income.

Hypothesis Testing: H_0 – Macroeconomic variables have no significant effect on per capita income in Nigeria.

Table 6: Short-Run Model of the Relationship between Macroeconomic Variables and Per Capita Income in Nigeria.

Dependent Variable: LPCI

Method: ARDL

Sample (adjusted): 1990-2018

Dynamic Regressors (4 lags, Automatic): LMS INF EXR LGOVT INT

Variables	Coefficient	Std. Error	t-Statistic	Prob.
LPC1(-1)	-0.237613	0.227087	-1.046354	0.3357
LMS	1.016698	0.373510	2.722011	0.0346
LMS(-1)	-0.044072	0.511319	-0.086192	0.9341
LMS(-2)	-0.654865	0.363843	-1.799855	0.1220
INF	0.005507	0.007450	0.739225	0.4877
INF(-1)	0.007119	0.004511	1.577961	0.1657
INF(-2)	0.005479	0.004084	1.341724	0.2282
INF(-3)	0.012971	0.003057	4.242489	0.0054
EXR	-0.006482	0.001271	-5.100220	0.0022
EXR(-1)	-0.000845	0.002600	-0.325044	0.7562
EXR(-2)	0.004499	0.002866	1.569856	0.1675
EXR(-3)	0.007921	0.002457	3.223961	0.0180
EXR(-4)	-0.006323	0.003638	-1.738115	0.1329
LGOVT	-0.244372	0.117591	-2.078159	0.0829
LGOVT(-1)	-0.857107	0.278140	-3.081568	0.0216
LGOVT(-2)	0.280580	0.436709	0.642488	0.5443
LGOVT(-3)	0.918845	0.292872	3.137362	0.0201
INT	-0.008896	0.018561	-0.479275	0.6487
INT(-1)	-0.002672	0.017804	-2.150097	0.0856
INT(-2)	-0.017572	0.018019	-2.975187	0.0671
INT(-3)	-0.042138	0.030485	-3.382258	0.0161
INT(-4)	-0.023027	0.010858	-7.120715	0.0082
C	6.780807	2.094756	3.237039	0.0178
R-squared	0.993696			
F-statistic	42.9987	Durbin-Watson Stat		2.601149
Prob (F-statistic)	0.000068			

The result of the short run effect of macroeconomic variables on standard of living as measured by per capita income is shown on Table 6. From the ARDL, the coefficient of the dependent variable (LPCI) introduced as an endogenous variable in the model showed a negative value at lag 1, but with probability value greater than 0.05. This means that standard of living is not an endogenous variable in the model.

Table 6 further revealed that Money Supply (M2) has positive relationships at current period but negative relationship at lags 1 and 2, respectively. However, only the current year short run result has significant effect. This suggests that a unit change in money supply would bring about a positive change in standard of living (per capita income) in Nigeria the current year of policy implementation. This study thus posits that money supply has a significant positive effect on standard of living in Nigeria.

Again Exchange Rate (EXR) was found to have a negative relationship with per capita income (standard of living) in the current year, lags 1, and 4; and positive relationship at lags 2, and 3, respectively. The p-values show that the coefficients are statistically significant in the current year and lag 3. This suggests that exchange rate has significant negative effect on standard of living (per capita income) in Nigeria in current year and a significant positive effect at the elapse third year. This means that exchange rate has mixed effect of standard of living in Nigeria. However, Government Expenditure (GOVT) showed negative relationship with standard of living at current year and lag 1; and positive relationships in their lags 2 and 3, respectively. The probability values are less than 0.05 in periods of lags 1 and 3. This indicate that government expenditure a significant negative effect on standard of living at elapse of the first year and a reversal positive effect in the third year. This means that government expenditure has mixed effect on standard of living (per capita income) in Nigeria.

The result of the Interest Rate ([NTR) revealed negative effects for all the short run periods from the current year to lag 4. The probability values indicate showed significant effects in lag 3 and 4, respectively. This means that interest rate has negative and significant short run effect on effect on per capita income (standard of living) in Nigeria.

On the overall, the coefficient of determination (R²) revealed that about 99% of the change in standard of living can be explained by macroeconomic variables in Nigeria. This is confirmed by a significant p.value of 0.0000 from the F-statistics (42.99187). The Durbin-Watson statistics of 2.401149 suggests that the result is reliable.

The results have shown that macroeconomic variables have a short run significant effect on public health in Nigeria. Specifically, money supply, and inflation rate have a significant positive effect on per capita income (standard of living), interest rate has a significant negative effect; whereas exchange rate and government expenditure have mixed dynamics shocks with negative and positive effects at varying short term periods in Nigeria.

Discussion of the Findings

The study examined the relationship between macroeconomic variables and per capita income in Nigeria for the period 1986-2018. Data were sourced from the CBN Statistical Bulletin and World Bank Development Indicator, 2018. The data generated were subjected to statistical and econometric analysis and the study revealed that macroeconomic variables have a significant position effect on per capita income in Nigeria.

The implication is that stable macroeconomic variables can increase per capita income of an individual in Nigeria. The finding is in line with the study of Fagbolun and Adekoye (2016) which examined the effect of selected macroeconomic variables on per capita income in Nigeria and found an indirect relationship. This also disagrees with study of Osagie, Igbinova and Erika (2019) who found insignificant relationship between macroeconomic variables and per capita income in Nigeria.

Summary of Findings, Conclusion and Recommendation

The study examined the effect of macroeconomic variables on per capita income in Nigeria for the period 1986-2018. The data for the study was analyzed using ARDL techniques. The results of the study are summarized as follows:

- Macroeconomic variables including money supply, inflation rate have a significant long-run effect and short-run effects on standard of living measured by per capita income in Nigeria. Specifically, money supply and inflation rate have a significant positive effect on per capita income (standard of living), with negative effect from interest rate, while exchange rate and government expenditure have mixed dynamics shocks with negative and positive effects at varying short-term periods in Nigeria.

- The study has shown that macroeconomic variables are authentic policy instrument for long-run ----- of per capita income (standard of living) in Nigeria. A combined management of money supply, inflation rate, exchange rate, government expenditure and interest rate are sufficient short-run policy instruments in managing standard of living (per capita income) of a developing economy like Nigeria. Money supply is the most powerful macroeconomic indicator of per capita income in Nigeria.

We recommend that relevant policy instruments we put in place to enhance per capita income through the creation of favourable socio-economic environment. This can be achieved by effect manipulation of the relevant policy instruments such as redistribution of income, employment drive and diversification of the economy away from oil dependent. These are necessary and highly important if Nigeria wants to move away from among the world poorest nation.

Private sector investment should be encouraged by the government at all levels to create employment opportunities. Government should reduce trade restrictions because this will result in an increase in openness of trade.

Government should ensure stable macroeconomic policies and also increase its expenditure in the area of infrastructural development as away to create more jobs and accelerate the growth of the economy.

Government should increase the education budget to accommodate the poor children on the street whose parents cannot afford school fees.

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