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Selected Macroeconomic Variables and Per Capita Income in Nigeria

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ABSTRACT
Per-capita income is a measure of economic well-being of an average citizen. The main objective of the study is to examine the effect of selected macroeconomic variables on per capita income in Nigeria. Specifically, the study determine the effect of money supply on per capita income in Nigeria, examine the effect of exchange rate on per capita income in Nigeria, analyze the effect of interest rate on per capita income in Nigeria, determine the effect of inflation rate on per capita income in Nigeria and assess the effect of unemployment rate variables on per capita income in Nigeria. The study employed econometric techniques, including Descriptive Statistics, Augmented Dickey Fuller for unit root and the Autoregressive Distributive Lag (ARDL). Our findings revealed that money supply, exchange rate, interest rate, inflation rate and unemployment rate have (65% long run and 73% short run) significant policy effects on the standard of living of an average Nigerian. The study concludes that selected macroeconomic variables have been effective short run and long run policy instrument that can largely influence standard of living of an average Nigerian citizen. This is supported from macroeconomic variables short run and long run influences on standard of living of average Nigeria citizen. In line with the objective and findings of the study, we recommend that: Central Bank of Nigeria should employ an expansionary monetary policy that can increase the money supply to the real sectors and boost standard of living of an average Nigerian citizen. The regulatory authorities in Nigeria should employ different set of measures to safeguard the value of the domestic currency in order to reduce the level of exchange rate fluctuation and improve standard of living of an average Nigerian citizen. Monetary authorities in Nigeria should reduce interest rate to encourage credit and boost productivity across the sectors which will improve standard of living of an average Nigerian citizen. A concerted effort should be made by policy makers to increase the level of output in Nigeria by improving productivity/supply in order to reduce the prices of goods and services (inflation) so as to enhance standard of living of an average Nigerian citizen. Inflation can be reduced to the barest minimum by increasing output level, gross domestic product in Nigeria. Government should embark on labour intensive technique of production as against capital intensive

Keywords: Selected Macroeconomic Variables, Per Capita Income, Nigeria

INTRODUCTION

Federal government tries to influence the performance of the national economy through various policies such as changing the level of taxation, government spending, or the supply of money available in the economy. Changing macroeconomic policies affect national income, prices, interest rates and exchange rates all of which influence economic development (Aroriode & Ogunbadejo, 2014).

Macroeconomics is still an evolving science but the goal of macroeconomic policy has been uniform globally. These include price stability, foreign exchange stability, full employment, balance of payment equilibrium, economic growth and development. Although these policies are very important and

necessary, they could not be pursued simultaneously because some of them conflict with each other. Therefore there is always a tradeoff between the various objectives hence a country pursues a policy which is relevant to its stage of development at different times and in different circumstances. Economic development seeks to achieve long-term sustainable development in a nation's standard of living, an increase in the per capital income of every citizen, adjusted for purchasing power parity (Ebikila, Agada, Lucky & Matthew, 2018).

Economic development' is a process in which a nation is being transformed and improved in the sector of the economic, political, and social well being of its people. Economic development preserves and raises the community's standard of living and enhance per capita income through the process of human and physical infrastructural development based on principles of equity and sustainability. There different indicators that economist uses to measure the level of economic development in a country includes per capital income, declining poverty rates, increasing literacy rate, declining infant mortality, increasing life expectancy, real gross domestic product, capacity utilization, human capital development and industrial output etc. Thus, it can be concluded that economic development leads to the creation of more opportunities in the sector of education, health sector, research, human development, capacity utilization, industrial output, full employment and environmental conservation. It equally implies an increase in the per capital income of the citizenry (Adegbemi, 2018)

Savings provide developing countries (including Nigeria) with the much needed capital for investment which improves economic development. Increase in savings leads to increase in capital formation and production activities that will lead to employment creation and reduce external borrowing of government. Low domestic saving rates may maintain low-growth levels because Harrod Domar model suggested that savings is an important factor for economic growth and development of a nation.

After independence in 1960, the immediate challenge that faced the Nigerian economy was how to accelerate economic development in order to reduce extreme poverty, improve health care, overcome illiteracy, strengthen democratic and political stability, improve the quality of the natural environment, diminish the incidence of crime and violence, and become an investment destination for international capital. Long-term broad-based economic development is essential for Nigeria to increase incomes and enable her reach her potential of becoming a significant trade and investment partner in the world. While rapid growths in China, Malaysia and India for instance, have lifted millions beyond subsistence living, Nigeria and many other African countries have, however, experienced the opposite by recording low growth rates (Olawale, 2015).

Government and policy makers have embarked on various macroeconomic policies to address these issues. Some of the policies involved the use of monetary and fiscal policy, export promotion strategy, imports substitution strategy, national economic empowerment development strategy (NEEDS). The fundamental objectives of the policies include price stability, maintenance of balance of payments equilibrium, promotion of employment, growth and sustainable development. These objectives are necessary for the attainment of internal and external balance of value of money and promotion of long run economic development (Nwoko, Ihemeji & Anumudu 2016).

The main causes of unsustainable development include high inflation, rising foreign debt, currency exchange rate volatility, consume more and save less, poor governance and policy implications, trade imbalance , spend more earn less, energy and water shortages and political instability (Paul & Akindele, 2016). The relationship between major macroeconomic variables such as gross domestic product, consumer price index, consumer confidence survey, current employment statistics, inflation, the labor market, currency exchange rate, interest rate and GDP growth rate depends on the state of economic development (Paul & Akindele, 2016).

Statement of the Problem

Since the introduction of the Structural Adjustment Programme (SAP) in 1986. The Nigerian economy has become more open to market forces and their attendant problems. All those while, the Nigerian economy had to deal with problems of high inflation rate and unstable per capita income, high and increasing rate of unemployment, trade imbalances, unstable exchange rate and high interest rate which had adversely affected per capita income in Nigeria (Abdul & Marwan, 2013).

Economists differ on which policies that could enhance for long-run growth and development. Antwi, Mills and Zhao, (2013) for example argue that macroeconomic policies are necessary for long-term per capita income. However, Adegbemi, (2018) postulated that monetary policy has greater and faster impact on economic activity thus suggesting that greater reliance be placed on monetary measures than fiscal measures in the conduct of stabilization policy.

Gatawa, Akinola, and Muftau (2017) asserted that monetary variable is more effective and dependable than fiscal variable in affecting changes in economic activities. Other scholars argue that the growth of human capital, that is, investment in education and training contributes significantly to long-run development (Barro, 1990).

Previous attempts to understand the effect of selected macroeconomic variables on per capita income in Nigeria have resulted in conflicting opinions. The existing studies disagreed both in the line of significance and direction of relationship. A number of the findings highlight significant influence from selected macroeconomic variables especially the moderating effect of money supply (Gatawa, Akinola, Muftau, 2017; Olawale, 2015; Muftaudeen, Hussainatu, 2014; Ojede, Amin, Daigyo, 2013; Madito & Khumalo, 2014). Despite agreeing that per capita income responds to macroeconomic variables, these studies are at variance as to the direction of the effects. This conflict makes it implausible to employ macroeconomic variables for sound per capita income policy and management.

Holden and Sparman, 2013; Pitia and Lado, 2015; Paul and Akindele, 2016, averred that all the macroeconomic variables they employed have a negative effect on per capita income in both the long and short run suggesting that growing money supply, interest rate, exchange rate and credit extension will rather hamper per capita income in Nigeria; as against the belief from studies like Onwanchukwu, (2015), Ozei, Sezgin and Topkaya, (2013), that macroeconomic variables enhance per capita income of the economy. Even at this, a number of studies out rightly argued that macroeconomic variables have no effect on per capita income (Onuorah, Osuji 2014; Olawunmi, Adedayo 2016). Aroriode and Ogunbadejo, (2014), noted that interest rate, exchange rate and inflation rate are not statistically significant tools for enhancing per capita income

Some researchers employed the Johanson cointegration test that may not adequately moderate variables with level 1(0) and first difference 1(1) stationarity in a regression estimation. Any study that employed a more robust Autoregressive Distributive Lag (ARDL) approach is most likely to produce better and more reliable empirical results (Anthony, Uzomba & Olatunji, 2013). These shortcomings have somehow contributed to the knowledge gap in the literature. This study seeks to improve on the past studies by using data from 1986 to 2021 a period of 35 years.

Objectives of the Study

The main objective of the study is to examine the effect of selected macroeconomic variables on per capita income in Nigeria. The specific objectives are to:

1. Determine the effect of money supply on per capita income in Nigeria
2. Examine the effect of exchange rate on per capita income in Nigeria
3. Analyze the effect of interest rate on per capita income in Nigeria
4. Determine the effect of inflation rate on per capita income in Nigeria
5. Assess the effect of unemployment rate variables on per capita income in Nigeria

Hypotheses

To test the findings of the study, the following null hypotheses are formulated

Ho_1: Money supply has no positive and significant effect on per capita income in Nigeria

Ho_2: Exchange rate has no positive and significant effect on per capita income in Nigeria

Ho_3: Interest rate has no positive and significant effect on per capita income in Nigeria

Ho_4: Inflation rate has no positive and significant effect on per capita income in Nigeria

Ho_5: Unemployment rate has no positive and significant effect on per capita income in Nigeria

REVIEW OF RELATED LITERATURE

Conceptual Framework

Macro-economic Variables

Macroeconomic variables are indicators or main signposts signaling the current trends in the economy. Keynes identified some main macroeconomic variables that relate to the economy as a whole: Gross Domestic Product (GDP), Exchange rate (EXR), Interest Rate, Inflation and Money Supply. GDP is a measure of the annual improvement in the standard of living of the average citizen/resident of a country and it takes into account all the production within the country (Aroriode & Ogunbadejo, 2014).

What is important is that the production takes place inside the territory of the country. Exchange rate is the rate at which one nation's currency is exchanged with another country's currency. If one nation's exchange rate is higher than another one, it affects the purchasing power of the lower exchange rate of a particular country. For example, if the naira rate is lower in comparison to the American dollar an American will have a higher purchasing power than a Nigerian. Interest rate is the cost of borrowing money.

Rising interest rate signals an expanding economy and when already high interest rate begins to rise even further and faster, it is a sure sign of the onset of inflation. Inflation in an economy can be the result of an increase in aggregate demand that is not accompanied by an increase in aggregate supply. A rise in any component of aggregate demand can bring about demand-pull inflation. Inflation can also result from a decrease in aggregate supply that occurs when businesses find that production inputs prices have risen. Such occurs when labour cost and the price of raw materials have risen. Money supply is the injection of money into the financial system. It is an important macro-economic tool for stabilizing the economy when there is recession (Ullah, & Rauf, 2013).

Per Capita Income

Per-capita income is a measure of economic well-being. Through its effect on economic development, it can indirectly affect sustainable development. Over the years, income per-capita was commonly used to describe the wellbeing of individuals in a specific period of time. This was usually done without putting into consideration the inter-temporal dimension in which sustainable development can be also affected by income per-capita level. Income per-capita level can indirectly affect sustainable development through its effect on economic development. This can be through the effect of income per-capita on education, health, migration and sanitation levels. Having low levels of income per-capita is more likely to reduce the individuals' access to high levels of education and knowledge. In addition, it deprives individuals from better nutrition which negatively affect their health status and productivity as well as it encourages migration from the country whenever possible. Also, low income per capita is associated with poor environmental conditions such as poor sanitation, high levels of pollution and lack of access to clean water. In particular, the literature is rich in tracing the effect of low levels of income per-capita on pollution emissions level as illustrated by the Environmental Kuznets Inverted U hypothesis (Kolawole, 2013).

Theoretical Framework

This study is anchored on Solow's Theory. Robert Solow and Swan introduced the Solow's model in 1956. Their model is also known as Solow-Swan model or simply Solow model. In Solow's model, other things being equal, saving, investment and population growth rates are important determinants of economic development. Higher saving, investment rates lead to accumulation of more capital per worker and hence more output per worker. On the other hand, high population growth has a negative effect on economic development simply because a higher fraction of saving in economies with high population growth has to go to keep the capital-labour ratio constant. In the absence of technological change and innovation, an increase in capital per worker would not be matched by a proportional increase in output per worker because of diminishing returns. Hence capital deepening would lower the rate of return on capital.

Solow neoclassical growth model is an extension of the theory of Cobb Douglass, explaining that the output or gross domestic product (GDP) depends on the technology, number of employees, amount of

physical capital, the amount of human capital, as well as the amount of natural resources. So it can be written by the following equation.

$Y = A\ f\ (L, K, H, N)$

Where f is the function that shows how the inputs are combined to produce output. *A* is a variable that indicates the availability of production technology. *L* is the amount of labor. *K* is the amount of physical capital. *H* is the amount of human capital, and *N* is the number of natural resources.

The first factor that determines the output of a country is labor. Economists argue that population growth will affect life in society. The most impact is the change in the total labor force. Large population will have a large labor force in producing goods and services. In addition, economists believe that growth is the engine of the world's population in technological progress and economic prosperity

The second factor is the physical capital. Physical capital is the completeness of the equipment and structures used to produce goods and services. Investment is one form of physical capital in the production function. Both domestic and foreign investment holds the contribution in accelerating the economic growth of a country.

Human capital is the third factor in the neoclassical growth model. Namely human capital acquired knowledge and skills of workers through education, training, and experience. Quality human capital will enhance the ability of a country to produce goods and services.

The fourth factor is the natural resources. Natural resources are inputs in the production activities provided by nature, such as land, rivers and mineral content in the earth. Many countries have good natural resources, bringing the country towards economic development

The fifth factor that determines the output of a country is the mastery of science and technology. Technological knowledge is an understanding of the best ways to produce goods and services. When there is a technological development, it will need less labor. So most of the workforce will be able to produce other goods and services, the result will be increased productivity

Empirical Review

Siyasanga, and Hlalefang (2017) investigated the dynamic impact of broad money supply on per capita income in South Africa using time-series data from 1980 to 2016. The study has employed the autoregressive distributed lag (ARDL)-bounds testing approach to cointegration and error correction model to investigate the impact of m3 on per capita income. The model is specified with four macroeconomics variables, namely, Gross Domestic Product (GDP) per capita, Broad money supply (M3), Interest rate (INT), Inflation rate (INF). The findings reveal that there is statistically significant positive relationship between money supply and per capita income both in short run and long run.

Khaysy and Gan (2017) examined the impact of money supply on the economic development Nigeria using annual time series data from 1989-2016. The unit root testing result suggests that all variables are stationary at first difference; therefore, the Johansen Cointegration and Error Correction Model were employed to analyze the association between variables. The finding shows that money supply, interest rate and inflation rate have negative effect on per capita income in the long run and only the real exchange rate has a positive sign. The error correction model result indicates the existence of short run causality between money supply, real exchange rate and per capita income

Gatawa, Akinola and Muftau (2017) empirically examined the impact of money supply, inflation, and interest rate on Nigeria economy using time series data from 1973-2013. VAR Model and Granger Causality test within error correction framework were used. The results of the VEC model provides an evidence in support of a positive impact of broad money supply while inflation and interest rate exhibits a negative impact on growth and development most especially in the long run. The short run parsimonious results revealed that with the exception of inflation, broad money supply and interest rate were negatively related to per capita income

Ebikila, Agada, Lucky, and Matthew (2018) examined the impact of money supply on macroeconomic variables in Nigeria from 1985 to 2016. The specific objectives of the paper were to ascertain the impact of narrow money supply, broad money supply, inflation rate, and exchange rate on real gross domestic product on one hand, and narrow money supply, broad money supply and exchange rate on consumer

price index in Nigeria. The ex post facto research design and descriptive statistics were used to observe the variables in retrospect. To achieve the objectives of the study, two models were built to mimic the tread. To avoid spurious results, the Augmented Dickey Fuller test was used to solidify the data, which integrated at first difference I(1). The ordinary least square technique was employed to determine the magnitude and direction of the variables in the models. It emerged that narrow money supply has a positive and significant impact on inflation and per capita income; conversely, broad money supply does not have any significant impact on inflation and real gross domestic pro per capita income. Empirical evidence further showed that exchange rate has an insignificant impact on inflation and per capita income. Inflation rate on the other hand, has an inverse and statistically insignificant impact on per capita income in Nigeria.

Mohamed, (2016) scrutinized the impact of money supply on Sri Lankan economy using time series data from the period of 1959 to 2013. The gross domestic product was considered as dependent variable, and Money supply, Exchange rate, Exports earnings, Imports outflow, the Colombo consumer price index were deemed as independent variables. The multivariate econometric method was used to test the impacts of money supply on economic growth and development of Sri Lanka. According to the analytical results, the money supply has kept positive impact on the economic growth and development of Sri Lanka at 1% significant level. The R- squared of the estimated model was 92% which was indicated that the estimated model was desirable. Meanwhile, the Durbin Watson test statistic was 2.43 and also the Breusch – Godfrey serial correlation LM test results was greater than 5%. Therefore, these statistics indicated that, the estimated model was not suffering from serial correlation.

Ifionu and Akinpelumi (2015) examined the effect and implication of selected macroeconomic variables on money supply (M2), using derived secondary data gotten from the Central Bank Statistical Bulletin (2013). Coupled with the application of econometric technique such as; O.L.S. causality test and Co-integration of time series data to estimate the long and short run relationship and causality of employed variables. The results revealed that all variables were stationary at various lags and there exists a long run relationship between variables employed and it was discovered that apart from inflation had an inverse significance with money supply (M2) and exchange Rate (EXR), all other variables such as gross domestic Product (GDP) were found to have a positive impact on money supply

Oluwole, and Olugbenga (2016) examined M2 money targeting, the stability of real M2 money demand, and the effects of deviations of actual real M2 growth rates from targets on real GDP growth and inflation rate on the Nigerian economy since the introduction of the Structural Adjustment Program (SAP) in 1986. The study employed cointegration vector error correction methodology using quarterly data from 1986:1 to 2001:4. The results indicate that a long-run relationship exists between the real broad money supply, real GDP, inflation rate, domestic interest rate, foreign interest rate, and expected exchange rate. Furthermore, both the CUSUM and CUSUMSQ tests confirm the stability of the short- and long run parameters of the real money demand function.

Mbutor (2014) determined the exact portion of the changes that occur in aggregate prices that could be attributed exclusively to the growth in money supply in Nigeria for the period of 1970 to 2012. The gross domestic product, nominal exchange rate, and the maximum lending rate are control variables, while inflation, proxy by the consumer price index and broad money supply are focus variables. All variables enter in logarithm forms, except interest rate. The impulse response function shows a persistent positive relationship between inflation and money supply. The variance decomposition of inflation shows that money supply accounts for up to 34.5 per cent of aggregate price changes until the tenth period.

Bozkurt (2014) examined money, inflation and growth relationship in Turkey by using co-integration test. Quarterly data of money supply (M2), GDP, velocity of money and deflator are used for the period of 1999:2 – 2012:2. According to the results from this paper, money supply and velocity of money are the main determinants of inflation in the long run in Turkey. On the other hand, 1% decreases in income directly reduces inflation by 1%.

Abate and Nandeeswara (2015) showed the causality effect between money supply growth and price level in Ethiopia using a co-integrated vector auto regressive (VAR) model over the period 1975 to 2012. To explore the short-run direction of causality between money supply and consumer price index (CPI),

granger causality test has been applied and in order to investigate the existence of long-run relationship, cointegration analysis was employed. The causation runs from money supply to prices, but price level does not cause money supply. The co- integration analysis established that money supply and CPI are found to be co-integrated suggesting an existence of long-run relationship.

METHODOLOGY

Research Design

An ex-post facto research design is adopted for this study because the data are time series data which were sourced from the Central Bank of Nigeria Statistical Bulletin, CBN Annual Reports and Statement of Accounts. National Bureau of Statistics. Independent variables are money supply, exchange rate, interest rate, inflation rate and unemployment rate while per capita income is the dependent variable

Model Specification

The model used for this investigation is the adaption and modification of the works of Uchenna and James (2016) VIZ PCI = f (M_2, EXR, ITR) Where: PCI = Per Capita Income M_2= Money Supply, EXR= Exchange Rate, ITR = Interest Rate and

Abdul (2016) VIZ PCI = f (M_2, EXR, ITR) Where: PCI = Per Capita Income M_2= Money Supply, EXR= Exchange Rate, ITR = Interest Rate

The above two models adopted PCI as the dependent variable and the independent variables are core macroeconomic variables. The models did not consider inflation rate and unemployment rate. Using the above two models, the present study formed a model of macroeconomic variables that included all the variables identified from the two studies above and also included inflation rate and unemployment rate because of some of its implied economic restrictions to trade and attendant effects of liberalized and free flow of economic resources.

The Model is Modified as Follows

PCI= f (M_2, EXR, ITR, IFR, UPR)

The Econometric Equation Form of the Model is:

$$PCI = \beta_0 + \beta_1 M_2, + \beta_2 EXR + \beta_3 ITR + \beta_4 IFR + \beta_5 UPR + \mu \quad - - - - - - - - - - - - \quad 1$$

Where:

PCI = Per Capita Income
M_2= Broad Money Supply
EXR= Exchange Rate
ITR = Interest Rate.
IFR = Inflation Rate
UPR=Unemployment Rate
μ = Stochastic Disturbance (Error Term)
f = Functional Relationship
$\beta 0$ = Intercept of Relationship in the Model Constant
$\beta 1$, $\beta 2$, $\beta 3$, $\beta 4$, $\beta 5$= are the Coefficients of the Independent Variables

DATA ANALYSIS

Descriptive Statistics

These measures the individual characteristics of the variables used in this study. The result of the descriptive statistics is presented in Table 1

Table 1: Descriptive Statistics for Selected Macroeconomic Variables and Per Capita Income in Nigeria

	PCI	M2	EXR	ITR	IFR	UPR
Mean	779.7860	4873.760	130.0147	18.69000	13.00000	10.46500
Median	728.3550	3217.910	129.0041	18.12000	12.00000	9.525000
Maximum	1383.890	11525.53	150.2980	24.85000	23.80000	18.88000
Minimum	351.8000	102.320	111.9433	15.14000	6.600000	4.500000
Std. Dev.	363.1133	3881.098	12.21667	2.624322	4.811560	4.637967
Skewness	0.281430	0.777810	0.442803	1.213791	0.975012	0.438356
Kurtosis	1.691545	2.026694	2.366218	4.244589	3.673977	2.030545
Jarque-Bera	0.845361	1.403034	0.494157	3.100901	1.773683	0.711861
Probability	0.655288	0.495833	0.781079	0.212152	0.411955	0.825521
Sum	7797.860	48737.60	1300.147	186.9000	130.0000	104.6500
Sum Sq. Dev.	1186661.	1.36E+08	1343.224	61.98360	208.3600	193.5966
Observations	**35**	**35**	**35**	**35**	**35**	**35**

Source: Authors computation from Eviews 9.0

The descriptive statistics showed the mean and standard deviation. The mean is the average value of each variable over the years while the standard deviation shows the variability of the values. The descriptive statistics also showed the maximum and minimum values. The Jarque-Bera statistics is the test of normality of the time series variables.

The variables of the study shown on Table 2 above indicate that the per capita income (PCI) has mean of 779.78% with minimum value of 351.8% and maximum values of 1383.8% respectively. However, the standard deviation is 363.11% indicating high variation in the per capita income (PCI) in Nigerian economy. This means that the Nigerian economy is relatively unpredictable and risky. This is capable of discouraging investment in the country.

Results of the descriptive statistics showed that money supply (M2) had a mean of 487.76% with standard deviation of 38.09 with minimum and maximum values of102.32% and 1152.53% respectively

Other contributions from each of the selected macroeconomic variables on economic development are exchange rate (130.0147%), interest rate (18.69000%), inflation rate (13.00000%) and unemployment rate (4.637967%) respectively. The standard deviation showed that the most volatile variable is money supply. The implication is that money supply is the most volatile variables among the selected macroeconomic indicators on per capita income in Nigerian.

Unit Root Test

Table 2: Summary Unit Root test for Stationarity

Variables	At Level 1(0)	At First Difference 1(1)	At Second Difference 1(2)	Order of Integration	Probability
PCI		-4.668720		1(1)	0.0008
M_2	-3.839292			1(0)	0.0070
EXR	-6.000361			1(0)	0.0000
ITR	-6.657659			1(0)	0.0000
IFR	-5.128101			1(0)	0.0003
UPR		-5.673721		1(1)	0.0008

Source: Researcher's Estimation using Eviews 9.0

The variables were tested for stationarity. The test aimed to understand the state at which the variables can be held stable for regression analyses. This test becomes pertinent because time series variables are often prone to non-stationarity which is capable of distorting the reliability of regression results. The variables used in the analysis were subjected to Augmented Dicker Fuller (ADF) Tests, to determine whether they are stationary series or non-stationary series. The variables were tested for stationarity at

"intercept only" and at "intercept and trend". The null hypothesis that is tested in both unit root tests is the presence of unit root.

The result on Table 3 revealed that at level, under the "intercept only", money supply, exchange rate, interest rate, inflation rate were stationary at 5% level [1(0)] while per capita income and unemployment rate were stationarity at first difference [1(1)].

From the analyses of stationarity of the variables, it was seen that the variables have mixed stationarity of level and first differences. The Autoregressive Distributive Lag (ARDL) approach which is capable of handling both stationary at level I(0) and first difference I(1) were used for the data analysis. Thus, the most suitable tool of analyses is the ARDL test that accommodates both the short and long run trends in testing the relationship between the dependent and independent variables.

ARDL (Bounds) Test for Cointegration of Selected Macroeconomic Variables and Per Capita Income in Nigeria

The result of the Bound test examined the presence of cointegration among the selected macroeconomic variables and per capita income in Nigeria. If the F-statistic of bound test is higher than the lower and the upper bound critical value at 5% significance level, the null hypotheses of no long run relationship is rejected, whereas if the F-statistic of bound test is lesser than the lower and the upper bound critical value at 5% significance level, long run relationship is accepted. The cointegration relation between selected macroeconomic variables and per capita income in Nigeria are presented in Table 4

Table 3. Result of the ARDL (Bounds) Test for Cointegration for Selected Macroeconomic Variables and Per Capita Income in Nigeria

ARDL Bounds Test
Date: 03/21/22 Time: 16:46
Sample: 1986 2021
Included observations: 35
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	K
F-statistic	5.710216	5

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.26	3.35
5%	2.62	3.79
2.5%	2.96	4.18
1%	3.41	4.68

Source: Eviews 9.0

The bound test is shown in Table 4. The result compared the F-statistics with the critical bound values. The F-statistics is 5.710216. The results showed that the F-statistic is greater than the lower bounds at 2.62 and upper bounds at 3.79 of the critical values at 0.05 level of significance. The implication is that there is a cointegration or long run relationship between selected macroeconomic variables and standard of living of an average Nigerian citizen.

Nature of ARDL Long Run Relationship and Speed of Correction to Equilibrium

Table 4: Model of the Long Run Relationship Between Selected Macroeconomic Variables and Per Capita Income in Nigeria

ARDL Cointegrating And Long Run Form
Dependent Variable: PCI
Selected Model: ARDL
Date: 03/21/22 Time: 16:55
Sample: 1986 2021
Included observations: 35

Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(PCI(-1))	0.177107	0.435459	3.606714	0.0041
D(PCI(-2))	0.545402	2.387049	2.409127	0.0039
D(PCI(-3))	5.283747	0.188074	4.508700	0.0016
D(M2)	3.013290	1.083061	3.160006	0.0020
D(M2(-1))	0.131303	0.064104	2.048278	0.0491
D(M2(-2))	-0.219305	0.107398	-2.041975	0.2899
D(EXR)	0.000101	0.000146	0.694087	0.6137
D(EXR(-1))	-0.000064	0.000106	-0.605938	0.6532
D(EXR(-2))	-0.000273	0.000148	-1.851638	0.3152
D(ITR)	7.647856	8.591087	0.890208	0.5369
D(ITR(-1))	-12.676724	14.569159	-0.870107	0.5441
D(ITR(-2))	10.626786	11.610065	0.915308	0.5281
D(IFR)	3.069620	2.668160	1.150463	0.0555
D(IFR(-1))	2.728040	2.972897	0.917637	0.5273
D(IFR(-2))	-4.653684	2.236149	-2.081115	0.2852
D(UPR)	0.060006	0.052555	1.141780	0.4579
D(UPR(-1))	0.017280	0.060055	0.287727	0.8216
D(UPR(-2))	-0.235356	0.046353	-5.077464	0.1238
CointEq(-1)	-6.54466	0.657859	-3.652032	0.0020

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
M2	0.017371	0.045342	2.383115	0.0271
EXR	0.500247	0.000211	3.168422	0.0407
ITR	2.834571	11.439203	1.821331	0.3197
IFR	3.430511	2.264132	1.515155	0.3714
UPR	0.229329	0.087373	2.624721	0.2317
C	4.042087	2.719885	3.722562	0.0348

Source: Eviews 9.0

Haven found presence of long run relationship between selected macroeconomic variables and per capita income in Nigeria from result of the Bound Test, further analyses presented in Table 5 aimed to explain the nature of the long run relationship. The results showed that the error correction term [CointEq(-1)] is rightly signed. The coefficient of the error term is -6.54466 with probability value of 0.0020. Since the p.value is less than 0.05, it connotes that the error term is statistically significant. This indicates that changes in the trend of standard of living of an average Nigerian citizen will eventually return on a growing normal trend over time. The coefficient indicates that about 6.5% of the deviations on standard of living of an average Nigerian citizen due to instability in selected macroeconomic variables can be corrected within a year. This implies that selected macroeconomic variables model can be used to

stabilize standard of living of an average Nigerian citizen. This suggests that selected macroeconomic variables have a significant policy adjustment effect on standard of living of an average Nigerian citizen within the period under review

Short Run Relationship

Table 5: Short Run Model of the Relationship Between Selected Macroeconomic Variables and Per Capita Income in Nigeria

Dependent Variable: D(PCI)
Method: Least Squares
Date: 03/21/22 Time: 16:46
Sample: 1986 2021
Included observations:35

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(PCI(-1))	3.177107	5.435459	2.406714	0.0041
D(PCI(-2))	4.545402	1.387049	3.409127	0.0329
D(PCI(-3))	0.283747	0.188074	-1.508700	0.3726
D(M2)	2.013290	0.083061	3.260006	0.0150
D(M2(-1))	1.350607	0.068646	5.107468	0.0031
D(M2(-2))	0.219305	0.107398	2.041975	0.0439
D(EXR)	0.360101	0.000146	0.694087	0.6137
D(EXR(-1))	-0.073337	0.000179	-1.881542	0.3110
D(EXR(-2))	-0.000273	0.000148	-1.851638	0.3152
D(ITR)	7.647856	8.591087	0.890208	0.5369
D(ITR(-1))	-2.049938	23.94093	-0.085625	0.9456
D(ITR(-2))	10.62679	11.61007	0.915308	0.5281
D(IFR)	3.069620	2.668160	1.150463	0.4555
D(IFR(-1))	-1.925644	2.133477	-0.902585	0.5326
D(IFR(-2))	-4.653684	2.236149	1.081115	0.2852
D(UPR)	-0.360006	0.052555	1.141780	0.4579
D(UPR(-1))	-0.518077	0.046469	1.692920	0.1337
D(UPR(-2))	-0.235356	0.046353	0.077464	0.1238
C	-708.4066	464.3839	-1.525476	0.3694
M2(-1)	0.030307	0.090145	0.336203	0.7935
EXR(-1)	0.000430	0.000397	1.084095	0.4743
ITR(-1)	36.34930	26.83070	1.354766	0.4048
IFR(-1)	5.985085	2.425515	1.467553	0.2451
UPR(-1)	-0.400101	0.032013	12.49822	0.0508
PCI(-1)	1.744663	0.657859	2.652032	0.0296

R-squared	0.758201	Mean dependent var	71.26269
Adjusted R-squared	0.735029	S.D. dependent var	311.9952
S.E. of regression	66.16280	Akaike info criterion	9.887094
Sum squared resid	4377.516	Schwarz criterion	11.09680
Log likelihood	-103.5322	Hannan-Quinn criter.	10.23545
F-statistic	53.12144	Durbin-Watson stat	2.389901
Prob(F-statistic)	0.000990		

Source: Eviews 9.0

The short run effect of selected macroeconomic variables on per capita income in Nigeria is explained in the result in Table 6. The analyses are interpreted based on the coefficient of the explanatory variables, and the coefficient of determination (R2). The statistical significance are confirmed using the t-statistics for the coefficient of regression, and F-statistics for the coefficient of determination.

Per Capita Income (PCI): The results showed that the coefficient of per capita income (PCI) is positive at 3.177107 with t-Statistic of 2.406714 and probability value of 0.0041 which suggest that per capital

income has positive and significant effect on the model at 0.05 levels of significance. This implies that per capita income (PCI) is an endogenous variable in the explanation of the effect of selected macroeconomic variables model on standard of living of an average Nigerian citizen in the short run

Money Supply (M2): The coefficient of money supply (M2) in the first year is positive at 2.013290 and after one year is1.350607 with t-Statistic of 3.260006 and 5.107468 with probability value of 0.0150 and 0.0031 which means that money supply (M2) has positive and significant effect on standard of living of an average Nigerian citizen in the short run

Exchange Rate (EXR): The coefficient of exchange rate (EXR) in the first year is positive at 0.360101 and after one year is negative at -0.073337 with t-Statistic of 0.694087 and -1.881542 with probability value of 0.6137 and 0.3110 which means that exchange rate has no significant effect on standard of living an average Nigerian citizen in the short run

Interest Rate (ITR): The coefficient of interest rate (ITR) in the first year is positive at 7.647856 and after one year is negative at -2.049938 with t-Statistic of 0.890208 and -0.085625 and probability value of 0.5369 and 0.9456 showing that interest rate has no significant effect on standard of living an average Nigerian citizen in the short run

Inflation Rate (IFR): The coefficient of inflation rate (IFR) at first year is positive at 3.069620 and after one year is negative at -1.925644 with t-Statistic of 1.150463 and -0.902585 and probability value of 0.4555 and 0.5326 which means that of inflation rate has negative effect on standard of living an average Nigerian citizen in the short run

Unemployment Rate (UPR): the coefficient of unemployment rate (UPR) at first year is negative at -0.360006 and after one year is negative at -0.518077 with t-Statistic of 1.141780 and -4.692920 and probability value of 0.4579 and 0.1337 which means that of unemployment rate has negative effect on standard of living an average Nigeria citizen in the short run

CONCLUSION

The study revealed that selected macroeconomic variables have (65% long run and 73% short run) significant policy effects on standard of living of average Nigerian citizen. The study therefore concludes that selected macroeconomic variables have been effective short run and long run policy instruments that largely influenced per capita income in Nigeria

RECOMMENDATIONS

The recommendations of the study are as follows:

1. Since selected macroeconomic variables have (65% long run and 73% short run) significant policy effects on standard of living of average Nigerian citizen. The study recommended that the Central Bank of Nigeria should employ an expansionary monetary policy that can increase the money supply to the real sectors and boost economic development in Nigerian
2. The regulatory authorities in Nigeria should employ different set of measures to safeguard the value of the domestic currency in order to reduce the level of exchange rate fluctuation and improve economic development in Nigeria
3. The monetary authorities in Nigeria should reduce interest rate to attract low interest rates that can encourage credit and boost productivity across the sectors which will improve economic development in Nigeria.
4. A major policy implication of this result is that concerted effort should be made by policy makers to increase the level of output in Nigeria by improving productivity/supply in order to reduce the prices of goods and services (inflation) so as to enhance economic development in Nigeria.
5. The main policy implication of this study is that government should embark on labour intensive technique of production as against capital intensive and also close the border to some extent which is the likely measure to reduce unemployment and improve economic development in Nigeria.

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