Exploring the Nexus Between Macroeconomic Indicators, Public Debt and Human Development in Nigeria (1986-2025)

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ABSTRACT

The motivation of this paper may be due to the surge in unsustainable debt and macroeconomic environment in Nigeria, the paper therefore examined the nexus between macroeconomic indicators, public debt and human development in Nigeria from the period of 1986 to 2025. The main objective of this paper was to examine the relationship between macroeconomic indicators, public debt on human development in Nigeria. The data for this research was sourced from the Central Bank (CBN) Statistical bulletin from 1986 to 2025. The paper employed Dynamic Ordinary Least Square (DOLS) which is a long run estimation technique, in achieving a predictable model, the paper employed Unit Root and Cointegration Test to avoid spurious regression. The result from the estimation shows that external debt (EXD), inflation rate (IFL) was statically significant in explaining the variation Human Development Index in Nigeria (HDI) in Nigeria, unemployment rate (UNEM) was positive but not significant in explaining a change in HDI. Based on the aforesaid, the paper recommend that Nigerian government should promote fiscal discipline, foster fiscal and monetary policy harmony and above sustain macroeconomic reforms to creates jobs.

Keywords: Human Development Index, External Debt, Inflation Rate, Unemployment, DOLS

INTRODUCTION

Economic development is therefore concerned with sustainable economic growth that promotes economic transformation (Ahmed et al, 2018). Human development globally is associated with economic development in terms of the citizens of a country having access to quality health care services, quality housing, economically engaged, quality and affordable education (Ahmed et al,2018). Meanwhile to achieve this development, the macroeconomic environment viz avid fiscal policy implementation helps in facilitating sustainable development which has been the concern of policy makers, economist and stakeholders. According to United Nation Development Program (UNDP). The macroeconomic environment plays a pivotal role in sharpening economic growth and development, hence sound macroeconomic with recourse to fiscal discipline and accountability promote the attainment of economic outlook for every economy (Abdulrauf, 2015). Macroeconomic variables such as inflation rate, unemployment rate, exchange rate etc. all facilitate the outcome of fiscal target. Fiscal performance through fiscal strategy paper (FSP) in Nigeria mostly relied on the attainment of achievable budget assumptions (Macroeconomic assumptions). One major aspect of this fiscal strategy is deficit financing through public debt (Akinwunmi et al, 2024)

Public debt in Nigeria has become one of the major instruments in managing deficit financing in Nigeria, apparently this development has witnessed several criticism owing to the fact that public debt management has been marred with misappropriation arising from both Executive and Legislative over-sight function in Nigeria. Public debt management is not perceived as a tool for development financing in Nigeria, rather it is a conduct-pipe for both the executive and the National Assembly members in satisfying their bourgeois financial needs. Development financing is a tool for promoting sustainable economic growth and development using public debt

in closing fiscal deficits gaps. Fiscal performance in Nigeria has been pre-occupied with series of challenges, chief among them is high debt GDP ratio, macroeconomic crisis resulting from exchange rate pass-through to inflation, high unemployment level, low level of budget performance in Nigeria.

The paper adopted inflation and unemployment rate as proxies for measuring macroeconomic indicators, while external debt portfolio was used as a proxy for measuring Public Debt and Human Development Index of United Nations Development Program (UNDP) was used for measuring human development.

The paper was motivated by the problem of unsustainable public debt in bring about evidenced-based economic development in Nigeria. The main objective of this paper is to explore the relationship between macroeconomic, public debt and human development in Nigeria. The specific objectives include;

a. examines the impact of foreign debt on Human Development Index (HDI) in Nigeria
b. determine the impact of unemployment on Human Development Index (HDI) in Nigeria
c. evaluate the extent to inflation rate impact Human Development Index (HDI) in Nigeria

Hypotheses of this paper is therefore;

H_1: There is no statistical association between foreign debt on Human Development Index (HDI) in Nigeria

H_2: There is no statistical association between unemployment rate on Human Development Index (HDI) in Nigeria

H_3: There is no statistical association between inflation rate on Human Development Index (HDI) in Nigeria

The macroeconomic variables and public debt variables constitute the explanatory variables while human development proxy was used dependent variable.

LITERATURE REVIEW

Theoretical framework

Human development is a state at which the physical, spiritual and physiological state of human existence is facilitated through sustainable economic development. Human development can be measured using the Human Development Index (HDI). The index constitutes areas such as National income, access to primary, secondary and tertiary education, low incidence of literacy level, low incidence of out of school children and access to health care services, low level of maternal mortality rate, low incidence of infant mortality rate etc.

Inflation rate is essentially the persistent rise in prices of goods and services in the economy, inflation can be triggered through many factors in Nigeria such as rational expectation, pricing matrix, exchange rate volatility, lack of harmony between monetary and fiscal policy etc. inflation can be computed through Consumer Price Index (CPI). Nigerian economy has experienced high surge in inflation rate from 2015 till date, though high level of prices in goods and services have declined to 15.5 percent as at the last quarter of 2024 given the economic reforms put in place by the government of President Bola Ahmed Tinubu.

Unemployment on the hand refer to those who are able and capable of working but are unable to secure one. Unemployment rate is the percentage of people in the labor force who are unemployed in the economy. Unemployment rate actually implies the level of economic engagement arising from productive economic productivity. Unemployment rate in Nigeria as at the last quarter of 2025 stood at 5.4 percent as against the forecasted 62 percent Nigeria to live below poverty line by the end of 2026.

Overview of Public Debt in Nigeria

Nigeria's indebtedness dates back to pre-independence era. The debts incurred before 1978 were relatively small and mainly long-term loans from multilateral and official sources such as the World Bank and Nigeria's major trading partners. The loans were majorly obtained on soft terms and therefore did not constitute a burden to the economy. However, due to the fall in oil prices and oil receipts, the country in 1977/78 raised the first jumbo loan to the tune of US$1.0 billion from the international capital market. The loan was used to finance various medium to long-term infrastructural projects.

Domestic debt management in Nigeria had hitherto been carried out by the CBN through the issuance of government instruments, such as the Nigerian Treasury Bills (NTBs); Nigerian Treasury Certificates; Federal Government Development Stocks; and Treasury Bonds.

The debt management strategy adopted at that time led to inefficiencies resulting in fundamental challenges. In consideration of these numerous difficulties, the government established an autonomous debt management office in order to achieve efficient debt management practices. The Debt Management Office (DMO) was thus established on October 4, 2000 to centrally co-ordinate the management of Nigeria's debt for all the tiers of government. While the state governments' external borrowing is guaranteed by the Federal Government (FG), their domestic borrowings required analysis and confirmation by the FG based on clear criteria and guidelines that the states can repay based on their monthly allocations from the Federation Account Allocation Committee (FAAC) and internally generated revenue (IGR).

The past couple of decades have witnessed rising concern on the increase in Nigeria's public debt. The first most significant rise in Nigeria's public debt occurred in 1987 when the total debt rose by 96.9 per cent to ₦137.58 billion. From then, the rise in Nigeria's public debt continued unabated such that as at 2004, total public debt stood at ₦6,188.03 million.

Theoretical Review

Philips Curve

The theory was propounded by A. W. H Philips in 1957 in the United Kingdom to examine the relationship between inflation and unemployment rate, this relationship is inverse one implying that as the economy experience economic growth and development, there is an upward pressure on the price of goods and services while unemployment rate decreases. The theory rather capture the trade-off between Economic growth and Unemployment is the upward pressure on the price level. The Nigerian economy as at 2016 to 2020 continues to experience stagnation; a situation where inflation and unemployment rate are moving in the same direction (Mankiw G.,2020). This period, the economy experienced economic recession in 2016 and 2020 with associated high level of inflation unemployment rate, and high debt to GDP ratio (Abayomi, 2022). The implication of this economic outcome created increase in poverty rate thereby making live difficult for the citizenry.

Debt Overhang Theory

The theory was formulated in by Krugman in 1988 and Sachs in 1989, they postulated the debt overhang theory where they explained the debt burden vicious circle (DBVC). The DBVC theory postulated that a Nations external debt burden requires high tax revenues to meet up with the requirements of debt repayment. Essentially this theory explains the fiscal crisis in Nigeria resulting from higher external debt portfolios with high level of repayment which stood at $1,078,093,808.72 Billion Dollars as at fourth quarter of 2024(DMO report, 2024)

Empirical Review

The issue of public debt, macroeconomic variables and human development in Nigeria has brought about an increasing literature regarding the determinants of public debt burden, macroeconomic environment and its impact on the economic development as well as the policy implications. Some of the empirical studies in this section borders on analysis carried out between public debt and macroeconomic variables and its impact on human development. Studies by Ekong et al(2025) concluded that public debt was significant in promoting economic development in Nigeria using the method of Vector Autoregressive Distributed Lags and Threshold Analysis to establish a non-linear relationship between public debt and economic growth in Nigeria using time series data from 1981 to 2022.

A study by Ekperiware and Oladeji (2012) examined the effect of external debt relief on economic growth in Nigeria using regression technique on quarterly time series of external debt, external debt service and real gross domestic product. Applying Chow- test to the regression result they found that there was a structural break in the relationship between economic growth and external debt in Nigeria during the period 1975 to 2005. The study concluded that the external debt relief made more resources available for economic growth in Nigeria and recommended a shift towards discretional concessional borrowing. It also identified external debt relief as a good option for poor unsustainable indebted countries as a way of making resources available for economic growth with the real sector being the focal point where value is created rather than impeding it with mismanagement and servicing debt. Similarly, Obademi (2012) used the ordinary least squares (OLS) technique in an augmented Cobb Douglas model in analyzing the impact of public debt on economic growth in Nigeria. The variables used were the external debt, domestic debt, total debt and budget deficit. He found that the impact of debt on economic growth was negative and quite significant in the long-run though in the short-run the impact was useful. He concluded that though the impact of borrowed funds on the Nigerian economy was positive in the short-run, its impact in the long-run depressed the economy as a result of inefficient debt management. In another attempt to study the impact of external debt management on macroeconomic performance in Nigeria, Ezike and Mojekwu (2011) applied the OLS technique on real GDP, total external debt stock and debt service ratio. Their results revealed that foreign capital inflow was positive as expected while debt service/export ratio was negative as expected. This was because debt capital adds to capital formation and positively impacted on economic growth. On the other hand, debt-service ratio reflects capital outflow and consequently deteriorates the performance of a country and thus reduces real GDP. It also confirms the theoretical expectations that debt service/export ratio diverts resources away from the debtor country. Since total debt stock depicts a positive relationship in the results instead of a negative relationship and statistically significant at all the levels, they therefore concluded that total debt stock, less debt service, still leaves a robust positive balance, to enhance capital accumulation that positively impacts economic growth. Also studies carried out byUdoka and Ogege (2012) examined the extent of public debt crisis and its consequences on economic development using data on the Nigerian economy for the period 1970 to 2010. They employed the error correction modeling framework with co-integration techniques to test the relationship between per capita GDP and other macroeconomic variables (foreign reserve, debt stock, investment, debt service payment). The test revealed that political instability may reduce the rate of development and other independent variables were responsible for the underdevelopment of the country. Hence, they recommended that, to avoid the crisis of economic development in Nigeria, public debt should be reduced to minimal level.

In an empirical investigation of the relationship between domestic debt and economic growth in Nigeria, Adofu and Abula (2010) using ordinary least square regression techniques explored the relationship between domestic debt and economic growth in Nigeria. The result showed that domestic debt affected the growth of the economy negatively. They recommended that government domestic borrowing should be discouraged and that increasing the revenue base through tax reform programs should be encouraged. To validate the belief that public sector borrowing spurs economic development, Onyeiwu (2012) carried out an investigation on the relationship between domestic debt and economic growth in Nigeria using the error correction modeling approach to regression analysis. He used quarterly data between 1994 and 2008 for GDP, foreign exchange rate, credit to private sector, budget deficit and money supply. The result showed that the domestic debt holding of government was far above

the healthy threshold of 35 percent of bank deposits, which resulted in a negative effect on economic growth. He recommended that government should maintain a debt-to-bank deposit ratio of below 35 percent, resort to increased use of tax revenue to finance its projects and divest itself of all projects the private sector can handle while providing enabling environment for private sector investments such as tax holidays, subsidies, guarantees and most importantly improve infrastructure.

METHODOLOGY

Research Design

The design is ex-Post factor research design that will take cognizance of secondary data extracted from the statistical bulletin of the Central Bank of Nigeria (CBN) and Nigerian Bureau of Statistics (NBS) for estimating the relationship between public debt, macroeconomic indicators and Economic development in Nigeria. The data for the research will be sourced from the statistical bulletin of Central Bank of Nigeria (CBN) and Nigerian Bureau of Statistics (NBS) from the period of 1986-2024**:** The method adopted by this paper will be Dynamic Ordinary Least Squares (DOL). To test for stationary of time series data, Unit Root Test will be carried using Augmented Dicky Fuller Test (ADF) and co-integration test will be carried out using Bound Co-integration Test Technique to ascertain long run equilibrium of time series data The paper will be carrying out post estimation test to avoid the challenges of spurious regression result. The procedures for this will include; Heteroskedasticity Test, Serial Correlation Test, Normality Test, CUSUM & CUSUMSQ Test

Model Specification

The model is adapted from the work of Akinwumi et al(2024), who examined the impact of public debt on infrastructural development in Nigeria.

IFR=f(DMD, FD, IF)

HDI=f(EXD, IFL, UNEM)

$HDI=\beta o+\Delta\beta exdt+\beta exd+\Delta\beta iflt+\beta if+\Delta\beta unt+\beta un+\omega$

RESULTS & DISCUSSION

Unit root Test for Variables of interest

Table 1: ADF Unit Root Test for EXD, IFL, UNEM & HDI

Variables	C.V		t-Statistic	Diff
:EXD	5%		-2.986225	I (1)
IFL	5%		-3.656166	I (1)
UNEM	5%		-5.910015	I(1)
HDI	5%		-3.820982	I(1)

Source: Student Computation using E-views 13 Version, 2026

Table 1 shows Augmented Dicky Fuller Test(ADF) for all the variables of interest, the result shows that all the variables were stationary at first difference. Also Table 2 shows that all the variables of interest were co-integrated both at upper and lower bound 5% level of significance since the F-statistics 5.311290 is higher than all the critical values, hence all the variables are co-integrated by removing all the seasonality factors that may produce spurious result (Ezie & Prosper, 2024).

Source: Student Computation using E-views 13 Version, 2026

4.2 Table 2: Bound Co-integration Test

Test Statistic	**Value**	**Signif.**	**I (0)**	**I (1)**
F-statistic	5.311290	10%	3.47	4.45
K	3	5%	4.01	5.07
		2.5%	4.52	5.62
		1%	5.17	6.36

REGRESSION RESULT

Table 3: Dynamic Ordinary Least Squares (DOLS) Result

Variables	**Coef.**	**Std error**	**t-statistic**	**prob.**	
LOG(EXD)	0.016901	0.007789	2.169925	0.0552	
INFL	-0.006815	0.003399	-2.005166	0.0728	
UNEM	0.002256	0.001514	1.490199	0.1670	
R-squared	0.779334	Mean dependent var		0.515696	
Adjusted R-squared	0.514534	S.D. dependent var		0.030857	
S.E. of regression	0.021499	Sum squared resid		0.004622	
Long-run variance	0.000641				

Source: Student computation using E-view 13 version,2026

Table 3 shows the estimated long run result using Dynamic Ordinary Least Squares (DOLS), the result shows that Externa debt was significant in explaining the change in Human Development Index (HDI) by 0.106,901.00 billion Naira, this is further justified by the probability value of 0.0552bwhich is less than 5 percent level of significance. Similarly, inflation was found to be statistically significant at 5 percent level of significant, this further implied that a unit change inflation rate will lead to increase/decrease in Human Development Index (HDI) by 0.0068 percent during the period under investigation. Finally, unemployment rate was positively related Humann Development Index (HDI) but was not statistically significant.

Post-Estimation Test

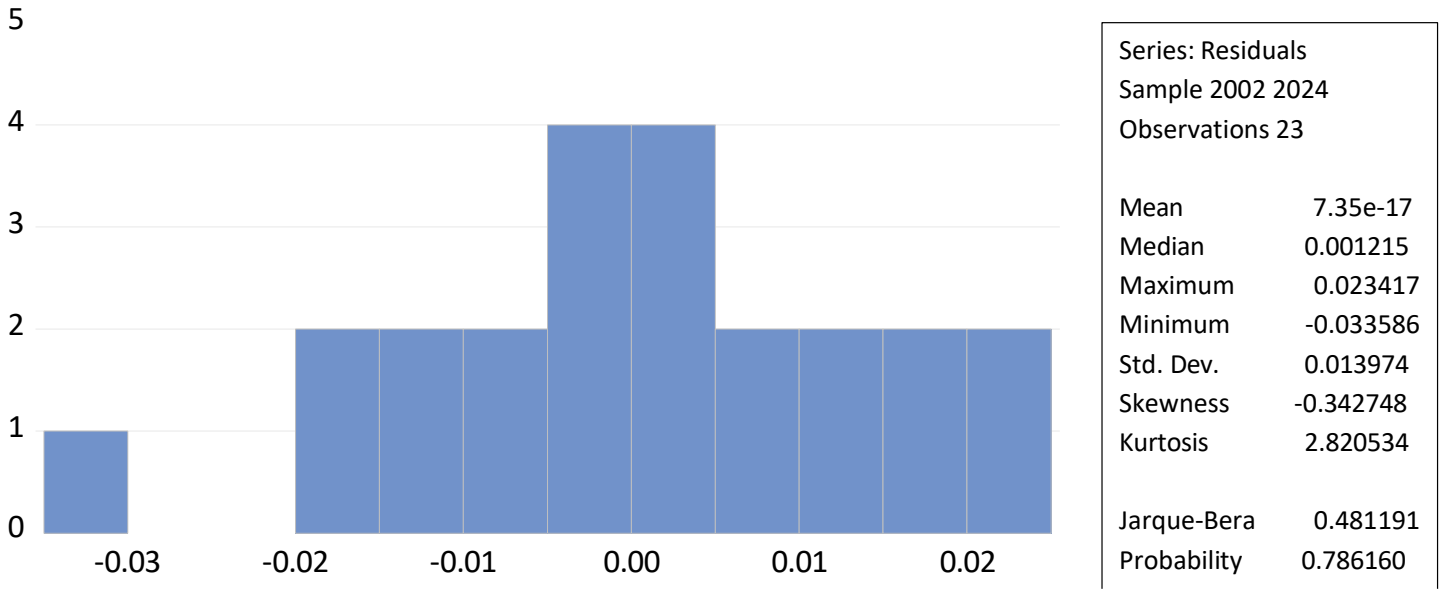

Figure 1:

Figure 1 is normality test that shows that all the variables of interest are randomly distributed about the mean. This further implies that there is symmetry of random variables about their mean. The probability value of 0.7866 indicates that we fail to reject the null hypothesis that variables are normally distributed.

Test of hypotheses

H_1: Foreign debt is not significant in determining Human Development Index (HDI) in Nigeria, the result from table3 indicated that foreign debt in Nigeria was statistically significant and this was evident from the probability value of 0.052 which was less than 5% hence the paper reject the hull hypothesis indicating that foreign debt has a positive and significant relationship with HDI in the long run period. Apparently, the policy implication of this outcome suggests that a one percent increase in foreign debt, all things being equal; will cause $1.6110 increase in HDI in Nigeria.

H_2: Unemployment Rate has no significant impact on Hunan Development Index (HDI) in Nigeria, also empirical evidence has shown that unemployment rate was not significant in determining the variation in HDI in the long run. This implies that a one-unit increase in unemployment rate will eventually lead to 0.20 percent increase in HDI in Nigeria

H_3: Inflation Rate has no significant impact on Hunan Development Index (HDI) in Nigeria, also empirical evidence has shown that inflation rate was also significant in determining the variation in HDI in the long run. This implies that a one-unit increase in inflation rate will eventually lead to 0.06 percent increase/reduction in HDI in Nigeria

DISCUSSION OF RESULT

From the long run estimation from the variables of interest, external debt was positively related with Human Development Index(HDI) and it was found to statistically significant in explaining the change in HDI in Nigeria, this statistical evidence was supported by the probability value of 0.055 which is less than 5 percent level of significance, hence we reject the null hypothesis that External debt is not statistically significant in explaining the variation in Human Development Index(HDI) in Nigeria. This statical outcome was corroborated with studies of

Akinwunmi et al, 2024 who examined the relationship between public debt and infrastructural contribution to economic growth and development in Nigeria. The evidence from this result shows the potential power public debt has in promoting economic development in Nigeria nevertheless, public not delivered its intended purpose for which they are borrowed to finance deficit balance of payment in the economy, this tendency was dated back to the epoch of Structural Adjustment Program (SAP) of the 1980s to finance deficit balance of payment resulting from the oil supply glut. Furthermore, the World Bank/ IMF forecasted economic outlook for 2026 put it that Nigeria's economy may face the risk of high Debt -GDP ratio may affect her negatively impact her growth trajectory of 4.1 percent (World Bank report, 2026).

From the long run estimation from the variables of interest also inflation rate was negatively related with Human Development Index(HDI) and it was found to statistically significant in explaining the change in HDI in Nigeria, this statistical evidence was supported by the probability value of 0.0728 which is less than 5 percent level of significance, hence we reject the null hypothesis that inflation rate is not statistically significant in explaining the variation in Human Development Index(HDI) in Nigeria. This statical outcome was corroborated with studies of Akinwunmi et al, 2024 who examined the relationship between public debt, inflation, exchange rate on infrastructural growth in Nigeria. The implication of this result is inflationary pressure through exchange rate pass though inflation affecting debt repayment which invariably affecting fiscal policy performance in Nigeria (World Bank report, 2025). Meanwhile the Central Bank of Nigeria (CBN) forescated year to year inflation rate of 2026 to be 12.5 percent, hence if this price level threshold is sustained with continued stability among other things, fiscal policy performance will be guaranteed.

From the long run estimation from the variables of interest also Unemployment rate was positively related with Human Development Index (HDI) in Nigeria and it was found not to be statistically significant in explaining the change in HDI in Nigeria, this statistical evidence was supported by the probability value of 0.0167 which is more than 5 the rejection area, hence we failed to reject the null hypothesis that unemployment rate is not statistically significant in explaining the variation in Human Development Index(HDI) in Nigeria. This statistical outcome was corroborated with studies of Akinwunmi et al, 2024 who examined the relationship between public debt and macroeconomic indicators on infrastructural growth in Nigeria. The implication of this shows that unemployment rate will ease out in the long run if macroeconomic reforms are sustained in Nigeria (Abayomie, 2022).

CONCLUSION & POLICY RECOMMENDATIONS

Conclusion

The result from table shows that external debt and unemployment rate were all positively related with Human Development Index in Nigeria, though unemployment rate was not statically significant in promoting the change in HDI in Nigeria. Nonetheless, both variables possess the potential of increasing development in Nigeria, this is because when unemployment rate declines it implies that implies the earning power of the citizens increases (Mankiw,2010). Likewise public debt is an instrument of development if the debt is deployed to finance the purpose for which it was borrowed (Abayomie,2022). Inflation rate om the other hand was found to be negatively with HDI in Nigeria, hence the increase/decrease price level will promote the change in HDI in Nigeria.

Policy Recommendations

I. Based on the statistical estimation outcome external debt was found to be statistically significant, hence Federal Ministry of Finance (FMF) should ensure that fiscal authorities in managing public finance enforce fiscal extant rules and discipline for sustainable growth and development.

II. Based on the statistical estimation outcome inflation rate was found to be statistically significant, therefore to sustain economic growth and development there is need for Money and Fiscal coordination and harmony in Nigeria.

III. Based on the statistical estimation outcome unemployment rate was not statistically significant, therefore to facilitate job creation, Fiscal and the Monetary authorities should sustain macroeconomic reforms capable of translating the gains to the real sector which is the major diver of the economy.

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