

## Public Debt and Economic Development in Nigeria: Impact Assessment

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### **Abstract**

*This study investigated the nexus between public debt and development of the Nigerian economy for the period 1990-2021. Treasury bills outstanding, treasury bonds outstanding, multilateral debt and bilateral debt were the classes of public debt considered while human development index (HDI) was used as a surrogate to measure the performance of the Nigerian economy. Data for the study were secondarily sourced from the statistical bulletin of the CBN (Central Bank of Nigeria), 2021 edition and the World Bank. The sourced data were exposed to descriptive analysis, unit root/stationarity test, ARDL and ECM estimations, co-integration analysis, and diagnostic tests which basically tested for the presence of autocorrelation, multicollinearity and heteroscedasticity. Amongst of other things, results revealed that in the short and long run, treasury bills, treasury bonds and bilateral debts have positive effects on HDI in Nigeria while only multilateral debts has a negative influence on HD in the country. However, none of these components of public debt has a significant relationship with human development index in Nigeria for the period considered. On these premise, it was deduced that there has been a positive but insignificant nexus between public debt and economic development in Nigerian over time. Hence the suggestion that to make public debt contribute significantly to the economic development in Nigerian, there is need to ensure that the country comes up with strong laws that will deter public office holders from embezzling public funds and as well punishes those who venture into such acts decisively. Thus, the onus lies with the country's legislators to enact appropriate laws as it is done in other countries and as well strengthen the legislative arm of government to enable them punish law breakers at all times.*

**Keywords:** Public Debt, Economic Development, Domestic Debt, External Debt

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## INTRODUCTION

The performance of an economy is usually expressed in terms of the achievement of economic objectives. These objectives can be long term, such as sustainable growth and development, or short term, such as the stabilization of the economy in response to sudden and unpredictable events, called economic shocks. To know how well an economy is performing against these objectives, a wide range of indicators economic indicators have been suggested. These indicators measure macroeconomic variables that directly or indirect enable economists to gauge whether economic performance has improved or deteriorated. Tracking these indicators is especially valuable to policy makers, both in terms of assessing whether to intervene and whether the intervention has worked or not. Traditionally, the key measures of economic performance in macroeconomics include economic growth real GDP growth, inflation, unemployment and current account. Other measures of economic performance include real disposable income, income inequality, labour productivity, investment levels, exchange rate, misery index, poverty levels and human development index (Qiu, Sung, Davis & Tchernis, 2018).

According to Jílková and Skaličková (2019) the Human Development Index (HDI) is the best known and the most accessible of the indicators. It is a composite index which includes real GDP per capita and also factors such as education, healthcare and environmental factors. Nevertheless, natural resources, technology, human resources and infrastructure are some of the major factors that contribute to growth in human development. Thus, developing countries like Nigeria have heavily invested in huge infrastructure projects. These projects create employment and spur an economy once they get underway. Also, since they are infrastructure projects, they are self-amortizing. Financing these projects has always been the issue in less developed countries (LDCs) as a result of their huge savings-investments deficits. It is expected that these LDCs when facing a scarcity of capital would resort to borrowing from either internal or external sources in order to supplement domestic savings(Safdari and Mehrizi, 2011). Hence, borrowing may be considered as a second best alternative to capital formation during periods of depression in an economy. Such borrowings constitute public debt, which may be grouped either in terms of term or area sourced from. In terms of term, public debt may be classified into long-term debt, when the debt is expected to last for a longer period of time and short-term debt, if the debt is designed to last for one or two years only. Also, it can be classified in terms of source; that is external debt and domestic debt. External debt refers to any financial resources which government and organizations are using that are borrowed from outside the shores of a country. Regardless of where it is borrowed from, it has both advantages and disadvantages; therefore any government or institution that has the intention of borrowing from these international institutions should consider the merits and demerits associated with it before it sets out to secure such funds. Domestic debt therefore is seen as debt that a government borrows within a country, which involves the same currency. Therefore all the amount of money that government owes internally such as treasury bills, treasury certificates, and Federal Government development stock, ways and means advances and treasury bonds are all regarded and grouped as domestic debt in Nigeria (Okon, Etim and Mfon, 2020).

Nigeria as a country has over time incurred both domestic and external debts. External debt is typically owed to foreign creditors. These are multilateral agencies such as the Africa Development Bank (ADB), the World Bank, or the Islamic Development Bank (IDB), and bilateral

agencies such as the China Exim Bank, the French Development Bank, or the Japanese Aid Agency. There are also foreign private creditors such as investors in Nigeria's Eurobonds. The domestic debt, however, is contracted within Nigerian borders, usually through bond and Treasury bills which are purchased by Nigerian banks, local pension funds, and other domestic and foreign investors. The government also has some contractor arrears, and other local liabilities which form part of total public debt.

There is an ongoing debate on the pros and cons of public debt. On the one hand are those who are of the opinion that the issue of public debt proliferation has exerted a negative effect on the economy of developing economies across the globe (Favour, Ideniyi, Oge and Charity, 2017; Panizza and Presbitero, 2012; Reinhart and Rogoff, 2010). On the other hand are those who believe that debt or borrowings is an important instrument of fiscal policy available to government to fund the development of a nation. To them, debt is employed in causing the settlement of expenditures that will ultimately increase productivity and improve the growth of the economy (Okon, Etim and Mfon (2020; Muhammad, Ruhaini, Nathan and Arshad, 2017).

Again, most of the reviewed studies on public debt and economic performance showed a bandwagon opinion where either normal or real Gross Domestic Product (GDP) is used as a proxy for economic growth/performance. However, given the deficiencies of GDP as an economic performance indicator, where a consistent increase in GDP does not reflect the real performance of an economy in terms of basic health care, education, food, and functional infrastructure; one wonders if these studies have actually shown the actual effects of public debt on the performance of a developing economy like Nigeria. On these backdrops, there was the need to join the debate by using human development index (HDI) (as a proxy for economic performance) to ascertain the true relationship between public debt and the performance of the Nigerian economy.

## **REVIEW OF RELATED LITERATURE**

### **Public Debt**

Public debt is also referred to as national debt. It is debt owed by the government or the aggregate of borrowings of all government units such the federal, state and local government (Idenyi, Igberian and Anoke, 2016). Public debt is also described as the aggregate of borrowings acquired by government bodies of a country, which includes funds owned to private organizations, public entities, foreign government etc. In the discourse of public debt, future pension payments, government liabilities and good and services received by government on credit are all considered. Idenyi, Igberian and Anoke (2016) affirmed that public debt forms one of the numerous approaches of financing government expenditures; although governments can instruct the Central Bank to produce and release funds to it so as to avoid the interest payment attached to government debts, this method will unarguably control interest cost but will not get rid of the debt. In fact, they further maintained that the ultimate result of such action is hyperinflation. Also, government can also increase tax in its bid to service its debt (Idenyi, Igberian and Anoke, 2016). Put differently, the aggregate of borrowings owed by government at all levels is referred to as public debt; and such borrowings arises when services like pension payment owed to its employees or in form of contract entered by the government are not cleared (Favour, Ideniyi, Oge and Charity, 2017). However, the

government can initiate borrowings through treasury bills, bonds, issuing securities and directly from international financial institutions. Debts have been categorized into two broad forms such as the external debt which is contracted outside the country and domestic debt which is described as debts raised from individual and corporations within the country. Furthermore, the reproductive debt and dead weight debt are other classification of debts. The former is referred to as a loan raised to cause the acquisition of assets that is urgently required for productive activities e.g. borrowing for electricity, refineries, acquisition of factors etc. Meanwhile, the latter - deadweight debt is referred to as debts contracted to execute unproductive activities e.g. debt undertaken to promote war or finance current expenses (Ajayi and Edewusi, 2020).

Usually, borrowed funds are used in enhancing the productivity level of a country and developing human capital through the provision of employment opportunities, delivering adequate infrastructural facilities and expanding the scope of private investment; thereby increasing economic growth and development. Albeit, as the height of public debt of countries maintained an increased level during the 1980s, a noticeable number of countries with a large stock of government debt received some financial support from the international financial groups. The reason for this assistance is to enhance productivity within less developed countries, reducing external debt stock, ennobling the standard of level of living of people and ultimately enhancing economic growth (Idris and Ahmad, 2017).

### **Treasury Bills**

Treasury bills (T-bills) are government guaranteed debt instruments with maturity of less than a year, issued by the Central Bank of a country on behalf of the government of the country to finance expenditures. Thus, they are issued to meet short-term mismatches in receipts and expenditure. Such bills are also used to control money supply in an economy (Ekpo, 2013). In other words, treasury bills are highly liquid instruments traded in the money market. They are usually issued by government as debt instruments with a maturity of 3 months (91-days). According to Idris and Ahmad (2017), in modern times, governments have utilized this instrument to cushion its temporary excesses of expenditure over its revenue. One major feature of treasury bills is that they are not subject to withholding tax, which makes it attractive in spite of its low yield. They are also eligible for rediscount at the secondary segment of the money market. In Nigeria, the CBN issues treasury bills and they are sold through a bi-weekly auction conducted by the apex bank. Buyers as such are requested to quote bids following which the average minimum bid is selected. Treasury bills can be bought through any official dealer. The easiest these days are through banks' treasury bill mobile application. A typical example is the Sterling Bank's i-invest (Akhanolu, Babajide, Akinjare, Oladeji and Osuma, 2018).

### **Treasury Bonds**

Treasury bonds (T-bonds) are also a form of government debt security issued by the central bank of a country on behalf of the government for a longer period of time and with a fixed rate of return. Its maturity periods range from 20 to 30 years. T-bond holders receive semi-annual interest payments, called coupons, from inception until maturity, at which point the face value of the bond is also repaid. In the United States, the U.S. Treasury issues 10-year zero-coupon bonds, which do

not pay any interest (Amilcar, 2016). Treasury bonds are motivated by the need for a steady, predictable return on investment. Such bonds can be purchased directly from the apex bank of a country or through a bank, broker, or mutual fund company. They are regarded as risk-free since they are backed by the full faith and credit of the government. The full faith comes from its ability to its citizens. Thus, T-bonds are part of government's treasury securities, which include treasury bills, and treasury notes. These securities are normally issued to raise funds for the government's day-to-day operations, defense spending, or funding development projects. In Nigeria, T-bond is one of the major domestic debt instruments and the first set of treasury bonds were issued in 1989 with an outstanding value of #11.35 billion (CBN, 2021).

### **Multilateral Debt**

Multilateral debt is that portion of a country's external debt burden owed to international financial institutions (IFIs) such as the International Monetary Fund (IMF) and the World Bank. In other words, such debt are debts owed by developing countries to the World Bank, International Monetary Fund (IMF) and other multilateral institutions, regional development banks and inter-governmental agencies (Joy and Panda, 2020). They added that governments of developed countries like the United States and Canada allocate tax revenue and provide guarantees to these multilateral institutions, which allow them to provide loans to developing countries. For most of the world's poorest countries, multilateral debt looms larger than other debts because of the IFIs' status as "preferred creditors", as providers of core development and balance of payment loans. This status means that payments to them must be given the highest priority, over private and bilateral debt. These institutions also maintain that their bylaws prohibit them from granting debt relief or writing off debts, as government and private creditors often do. Thus, governments have special incentive to stay current with their multilateral debts, since IFI's determine the creditworthiness of countries: until the IMF gives its stamp of approval, which usually requires adherence to the economic policies it recommends, poor countries generally cannot get credit or capital from other sources. And until a country has signed onto an IMF programme, it cannot apply for bilateral debt relief from the "Paris Club" of creditor countries (Amilcar, 2016).

### **Bilateral Debt**

According to Merritt (2017), a bilateral debt is a simple loan arrangement between a single borrower and a single lender. Such loans are called bilateral because there are only two parties to the loan, each with an obligation to the other, whereby one will provide a specific amount of money under the terms of the loan agreement, and the other will repay the money as provided for in that same agreement. In other words, bilateral debt/loan is a loan agreement between a borrower and a single lender as opposed to a syndicated loan agreement where there are multiple lenders. In some financial transactions, the borrower may have two or more bilateral loan agreements, each with a different lender. All the bilateral loan agreements will have substantially the same terms and conditions. Together, they comprise an aggregate financing package for the borrower. Rather than having one large loan facility with multiple lenders and a single agent bank that administers the loan on behalf of the lenders (as in a syndicated loan), each bilateral lender will administer its own loan (Spilioti and Vamvoukas, 2015). From the foregoing, it implies that bilateral debt is that portion of a country's external debt burden owed to the government of another nation as a given

time. Thus, it is a class of external debt that arises as a result of a simple loan arrangement between the governments of two countries, that is, it is a government to government transaction.

### **Economic Development/Performance**

Performance is a term that cuts across every field of human endeavor. The Oxford Advanced Learners Dictionary defines it as the act or process of performing a task, an action etc. The European Central Bank (ECB) (2010) defines it as an approach to determining the extent to which set objectives or goals of a country are achieved in a particular period of time. Thus, performance in this respect can be seen as the ability of a country to meet laid down goals and/ or objectives. These objectives include amongst others, economic growth, price stability, exchange rate stability, favourable exchange rate etc. Accordingly, Jílková and Skaličková (2019) stated that the performance of an economy is assessed by default using gross domestic product, a standard macroeconomic indicator by which the success rates of countries or regions are calculated. However, GDP has many shortcomings. Therefore, alternative indicators are needed for the measurement of not only economic performance, but also of welfare and economic development. Even a small increase in the GDP as an indicator of prosperity means real improvement in poor and developing countries, where basic health care, education, food, and functional infrastructure are not sufficiently available. In these states, every increase in the GDP also represents an increase in the life satisfaction of the population. Diener and Seligman (2004) have argued, regarding this point, that national economic indicators alone are now “out of sync” with national well-being in the developed nations.

### **Human Development Index**

In the literature, a whole lot of indicators have been put forward for measuring economic performance but the most acceptable one is human development index., which is a composite index that takes into consideration different aspects of development like health, education and standard of living with many sub-variables such as life expectancy, adult literacy rate, gross enrollment ratio and per capita income (Kairo, Mang, Okeke and Aondo, 2017). Human Development Index (HDI) is the best known and the most accessible of the indicators. This index was created to emphasize that people and their abilities should be the ultimate criteria for assessing the development of a state, not the GDP (gross domestic product) and its growth alone. HDI measures three dimensions: a long and healthy life, knowledge, and a decent standard of living. It was methodologically updated in 2010. The methodological framework for HDI is still being developed. Qiu, Sung, Davis, Tchernis (2018) have proposed the Bayesian factor analysis model as an alternative to the Human Development Index. Omnari, Alizadeh and Amimi (2019) have proposed a new approach to the calculation of semi-HDI scores. The semi-HDI scores of provinces/regions/countries can be calculated based on the geometric mean of standards for a healthy life, the education of a given population and living standards.

### **Theoretical Review**

#### **The Debt Overhang Hypothesis**

According to Gordon and Cosimo(2018) debt overhang theory implies that large borrowing leads to high debt, debt traps and slowing down of economic growth. Thus, the debt overhang hypothesis states that if there exist the likelihood that in the future government debt will be larger than the country's repayment ability; expected debt service costs will discourage further domestic and foreign investment. Potential investors would be discouraged on the assumption that the more there is production, the more they will be taxed by governments to service the public debt and thus they will be less willing to incur investment costs today for the sake of increasing future output. In particular, the theory argued that the requirement to service debt reduces funds available for investment purposes; hence, a binding liquidity constraint on debt would restrain investment and further retard growth. The theory holds that both the stock of public debt and its service affect growth by discouraging private investment or altering the composition of public spending (Coccia, 2017).

### **Debt Crowding-Out Hypothesis**

According to the debt crowding out hypothesis, higher debt service payments can increase a country's budget deficit, thereby reducing public savings if private savings do not increase to offset the difference. This, in turn, may either drive up interest rates or crowd out the credit available for private investment, thereby depressing economic growth (Yusuf and Mohd, 2021). When government increases borrowing to fund higher spending, or reduce taxes, it crowds-out private sector investment through higher interest rates. If increased borrowing leads to higher interest rates by creating higher demand for money and loanable funds and thus higher prices, the interest rate sensitive private sector will likely reduce investment due to lower rate of returns. A fall in business-fixed investment will hurt long-term supply-side economic growth, that is, potential production growth. This crowding-out effect is weakened by the fact that government spending through the multiplier increases the demand for private sector products, thereby stimulating fixed investment via the acceleration effect (Joy and Panda, 2020). In other words, government deficit financing through domestic and external borrowing might result in increased interest rates, lower disposable income and higher wages all of which reduces the profitability of businesses and by extension private investment. This may consequently discourage or crowd-out private investment and decrease the production level in an economy (Spilioti and Vamvoukas, 2015).

### **The Keynesian theory**

The major proponent of this theory is John Meynard Keynes, who views fiscal policy as the best policy that brings about growth in any economy since it acts in the interest of the general public. According to Keynes, when the government embarks on public borrowing to finance its expenditure, unemployed funds are withdrawn from the private pockets such that the consumption level of private individuals remains unaffected. These funds when injected back into the economy by the government leads to a multiple increase in aggregate demand causing an increase in output and employment. Hence, public borrowing can be used to influence macroeconomic performance of the economy (Matthew and Mordecai, 2016). On the other hand, the indirect effect of public borrowing is its effect on investment. The transmission mechanism through which debts affect growth is its reduction on the resources available for investment by debt servicing. Also, public debt can act as an implicit tax on the resources generated by a country and create a burden on future

generations which come in the form of a reduced flow of income from a lower stock of private capital. This in turn, may lead to an increase in long-term interest rates, a crowding out of private investments necessary for productivity growth, and a reduction in capital accumulation (Jhingan, 2010).

### **Empirical Review**

Yusuf and Mohd (2021) investigated the effect of government debt on Nigeria's economic growth using annual data from 1980 to 2018 and the Autoregressive Distributed Lag technique. The empirical results showed that external debt constituted an impediment to long-term growth while its short-term effect was growth enhancing. Also, domestic debt has a significant positive impact on long-term growth while its short-term effect was negative. In the long term and short term, debt service payments led to growth retardation confirming debt overhang effect. The findings suggested that the government should direct the borrowed funds to the diversification of the productive base of the economy. This will improve long-term economic growth, expand the revenue base and strengthen the capacity to repay outstanding debts when due. Fiscal improvements that encourage domestic resource mobilization, efficient debt management strategies and reliance on domestic debt rather than external debt for increased deficit financing to engender greater growth were the main recommendations of the study.

Ajayi and Edewusi (2020) examined the effect of public debt on the economic growth of Nigeria. Secondary time series data spanning thirty-seven years (1982-2018) was used for the study. Data gathered for the study was estimated using descriptive statistics, unit root test, Johansen cointegration test and vector error correction model. Discoveries from the study suggested that external debt exerts a negative long run and short run effect on economic growth of Nigeria and domestic debt was ascertained to exert positive long run and short run effect on economic growth of Nigeria. Based on these findings, the study suggested that policy makers should integrate appropriate measures towards ensuring suitable management of domestic debts; government should ensure that contracted national debts are directed towards encouraging investment in the country and government through necessary monitoring committees should ensure that national debts are directed towards the provision of basic amenities and services required for the development of communities and societies of the nation.

Mhlaba, Phiri and Nsiah (2019) employ the ARDL method and quarterly data from 2002 to 2016 to examine the long-run and short-run effects of public debt on economic growth of South Africa. The study modeled GDP as a function of gross and net debt, investment, inflation and terms of trade. The empirical results indicated a significant negative impact of public debt on economic growth.

Saungweme and Odhiambho (2019) explored the causal relationship between government debt, debt servicing and economic growth in Zambia for the period 1979 to 2017 using a dynamic multivariate ARDL approach. To achieve this objective, RGDP was modeled as a function of stock of public debt, fiscal balance and savings as a share of GDP. The empirical results indicated a unidirectional causal relationship from economic growth to public debt in Zambia. Findings from



the study support the hypothesis that the pace of economic growth matters in defining the level of public sector indebtedness.

Thao (2018) analyzed the effect of government debt on economic growth in six ASEAN countries, namely, Indonesia, Malaysia, Philippines, Singapore, Thailand and Vietnam over the period 1995–2015. The General Method of Moments (GMM) estimation technique was adopted to measure the effect of government debt indicators on economic growth. The findings revealed a significant and positive impact of public debt, foreign direct investment (FDI), gross fixed capital formation (GFCF) and real effective exchange rate on economic growth; while population growth has a significant negative effect on the growth rate of these countries.

Akhanolu, Babajide, Akinjare, Oladeji and Osuma (2018) examined the effect of public debt on economic growth of Nigeria using annual data from 1982 to 2017 and two-stage least square regression technique. The study modeled GDP as a function of internal debt, external debt, savings and capital expenditure. The results revealed that external debt has a significant negative impact on growth while internal debt has a positive impact.

### **Gap in Literature**

In differing from most empirical studies previously conducted public debt and economic performance, the current study contributes to the literature in two ways. Firstly, previous studies have used different indicators but HDI (human development index) to measure economic growth and economic performance. Given the superiority of HDI as a more robust measure of economic performance, this study stands out. Secondly, the current study is a country specific one whereas some previous studies have been panel based. This is significant since panel-based studies tend to generalize the findings from a singular regression estimate for a host of economies with varying country-specific characteristics.

### **METHODOLOGY**

This study adopted quantitative and descriptive research design using already existing data to provide empirical answers to the research problems. Descriptive research designs help provide answers to the questions about who, what, when, where and how connected with a research problem. A descriptive research design cannot conclusively establish answers to the why problems associated with a research. It is used to generate information on the current state of a phenomenon and to explain what exists with respect to variables (Joy and Panda, 2020). The data used in this study were gathered from secondary sources. These data were time series in nature and collected using the desk survey approach from Central Bank of Nigeria (CBN) and the World Bank database. In other words, data for this study were secondarily sourced from CBN statistical bulletin for 2021 and World Bank Development Indicators (WDI). The macroeconomic variables on which data were collected included HDI, treasury bills outstanding, treasury bonds outstanding, multilateral and bilateral debts.

## **Data Analysis Techniques**

The set of data generated for this study were first converted to the same scale of measurement. That is, the data were first standardized before they were subjected to the following analysis and tests;

### **Descriptive Analysis**

This was the first analysis carried out in this study. It is a type of analysis that help describe, show or summarize data points in a constructive way such that patterns might emerge that fulfill every condition of the data. It gives conclusion of the distribution of data, helps to detect typos and outliers, and enables one to identify similarities among variables, thus giving room for further statistical analyses (Emanakuku, 2010). In essence, descriptive analysis covers measures of frequency, central tendency, dispersion and position. Specifically, descriptive analysis in this study covered mean, median, maximum, minimum, standard deviation, skewness and kurtosis of our data set.

### **Unit Root Test**

This test is necessary in time series analysis because it enabled the researcher to know if the variables involved in our study model were stationary or not. A time series is said to be stationary if its mean and variance do not vary systematically over time. In other words, a stochastic process is said to be stationary if its mean and variance are constant over time and the value of the covariance between the two time periods depends only on the distance or gap or lag between the two periods and not the actual time at which the covariance is computed (Gujurati and Porter, 2009). Stationarity test examines the characteristics of the variables selected to avoid the problem of spurious correlation often associated with non-stationary time series and general long-run equilibrium relationships concurrently. Hence, since most time series data are not stationary, there is need to change them and make them stationary before using them for further analysis. According to Engel and Granger (1999), unit root test is basically required to ascertain the number of times a variable has been differenced to arrive at stationarity

Accordingly, the order of integration of variables was verified using the test of unit roots through the Phillip-Perron test criterion. The major advantage of Philips-Perron (PP) test is that it is non-parametric; that is, it does not require the selection of the level of serial correlation as in the case of Augmented Dickey-Fuller (ADF). It instead takes the same estimation scheme as in Dickey Fuller (DF) test, but corrects the statistic to conduct for autocorrelations and heteroscedasticity. The PP test also takes care of the autocorrelation in the error term and its asymptotic distribution in the same way as that of the ADF test statistic (Puatwoe and Piabuo, 2017).

### **Co-integration Analysis/Test**

According to Harris (2012), co-integration analysis arose from the need to integrate short-run dynamics with long-run equilibrium through the inclusion of an ECM (Error Correction Mechanism) in the dynamic formulation of the model for estimation. The bounds test approach to co-integration was adopted to examine if long run relationship exists among the underlying

variables used in this study, which are: human development index, treasury bills outstanding, treasury bonds outstanding, multilateral debt and bilateral debt. For this test, the null hypothesis of no co-integration will be tested against the alternative hypothesis of co-integration with the application of Fisher's test (F-test).

### ARDL Estimation

The major analytical technique adopted in this work was that suggested by Pesaran, Shin and Smith (2001), known as Autoregressive Distributive Lag Model (ARDL), which is based on the general to specific modeling technique. One of the unique features of this technique is that it permits the use of variables that become stationary without differencing I(0) and variables that become stationary after first differentiation I(1), and it does not accept variables that become stationary after second differentiation I(2). In addition, rather than having a multiple equation to estimate as in the case of the Vector Autoregressive (VAR) model, ARDL involves just a single-equation set-up, which makes it simple to implement and interpret. In addition, with ARDL, it is easy to derive the error correction model from simple linear transformation by integrating short run adjustments with long run equilibrium without loss of information (Nayaran, 2005).

### Model Specification

The relationship between public debt and the performance of the Nigerian economy can be functionally expressed as:

$$HDI = F (TRBL, TRBN, MLDE, BLDE) \quad (1)$$

Where:

HDI	=	Human Development Index
TRBL	=	Treasury Bills Outstanding
TRBN	=	Treasury Bonds Outstanding
MLDE	=	Multilateral Debts
BLDE	=	Bilateral Debts

The ARDL version of the above functional model can be given as:

$$HDI_t = P_0 + \Pi_1 HDI_{t-1} + \Pi_2 TRBL_{t-1} + \Pi_3 TRBN_{t-1} + \Pi_4 MLDE_{t-1} + \Pi_5 BLDE_{t-1} + \sum_{i=1}^m Z_1 \Delta HDI_{t-1} + \sum_{i=1}^m Z_2 \Delta TRBL_{t-1} + \sum_{i=1}^m Z_3 \Delta TRBN_{t-1} + \sum_{i=1}^m Z_4 \Delta MLDE_{t-1} + \sum_{i=1}^m Z_5 \Delta BLDE_{t-1} + e_{it} \dots (2)$$

Where:

$P_0$	=	Constant Parameter
$\Pi_1 - \Pi_4$	=	Long run multipliers
$Z_1 - Z_4$	=	Short run dynamic parameters of the regressors
$e_{it}$	=	Random disturbance
$m$	=	Optimal lag length
$\Delta$	=	First difference operator

### A priori Expectations

$$\beta_1, \beta_2, \beta_3, \beta_4 > 0$$

## ANALYSIS AND INTERPRETATION OF RESULTS

**Table 1: Descriptive Analysis**

	HDI	TRBL	TRBN	MLDE	BLDE
Mean	0.468938	1280.478	265.1691	1200.213	28.16438
Median	0.469500	765.6200	276.1050	381.6450	13.86000
Maximum	0.539000	3786.140	430.6100	7704.860	248.0600
Minimum	0.328000	25.48000	19.01000	34.61000	0.000000
Std. Dev.	0.055248	1194.886	143.4369	1901.088	46.19754
Skewness	-0.769266	0.747646	-0.268765	2.287318	3.535649
Kurtosis	3.143438	2.052819	1.662912	7.465079	17.21297
Jarque-Bera	3.183539	4.177397	2.768990	54.48562	336.0159
Probability	0.203565	0.123848	0.250450	0.000000	0.000000
Sum	15.00600	40975.31	8485.410	38406.81	901.2600
Sum Sq. Dev.	0.094622	44260305	637798.4	1.12E+08	66160.60
Observations	32	32	32	32	32

**Source:** E-Views Output (2024)

The above are the descriptive properties our variables. It specifically shows that the average value of HDI for the period covered in this study is about 0.468, which falls below the mean value of 0.5, on a scale of 1-10. The table also demonstrates that amongst the various classes of public debt considered, treasury bills outstanding for the same period has the highest mean value of #1280.478 billion, followed by multilateral debts at #1200.213, treasury bonds outstanding and bilateral debts at #265.1691 billion and #28.16438 billion respectively.

**Table 2: Unit Root Test**

Variables	P-P Value	Critical Value (5%)	Probability Value	Order of Integration
HDI	-14.49652	-2.963972	0.0000	I(1)
TRBL	-3.029081	-2.960411	0.0431	I(0)
TRBN	-4.399265	-2.963972	0.0016	I(1)
MLDE	-5.962179	-2.963972	0.0000	I(1)
BLDE	-3.545571	-3.004861	0.0163	I(1)

**Source:** E-Views Output (2024)

Adopting the Phillips-Perron (P-P) criterion to unit root test, the above table shows that the variable TRBL was stationary was stationary level I(0) while the rest were stationary at first difference I(1). In the first place, it shows that the data set was in order and can be used for further analysis. In addition, the order of stationarity informed the need to adopt ARDL technique in this study.

**Table 3: ARDL Estimation**

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
HDI(-1)	0.092836	0.312711	0.296874	0.7716
TRBL	0.063006	0.038726	1.626985	0.1297
TRBN	0.028699	0.037055	0.774504	0.4536
TRBN(-1)	0.007407	0.034725	0.213303	0.8347

TRBN(-2)	0.012775	0.028872	0.442451	0.6660
MLDE	-0.010130	0.039017	-0.259621	0.7996
BLDE	0.017195	0.015971	1.076670	0.3028
BLDE(-1)	-0.021178	0.021130	-1.002269	0.3360
BLDE(-2)	0.012948	0.015867	0.816067	0.4304
C	-1.352216	0.501678	-2.695385	0.0195
R-squared	0.857656	Mean dependent var		-0.794490
Adjusted R-squared	0.750897	S.D. dependent var		0.097076
S.E. of regression	0.048451	Akaike info criterion		-2.913580
Sum squared resid	0.028170	Schwarz criterion		-2.417652
Log likelihood	42.04938	Hannan-Quinn criter.		-2.796754
F-statistic	8.033626	Durbin-Watson stat		1.985350
Prob(F-statistic)	0.000715			

\*Note: p-values and any subsequent tests do not account for model selection.

**Source:** E-Views Output (2024)

The above table contains short run ARDL estimates. Basically, it shows that only multilateral debt and lagged bilateral debt BLDE (-1) have inverse effects on HDI as the other variables have positive effects in the short run. However, none of the variables was statistically significant at 5% level of significance.

**Table 4: Test for Co-integration**

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	3.813558	10%	2.2	3.09
K	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37

**Source:** E-Views Output (2024)

Adopting the bounds approach to co-integration test, it was revealed that there is a long run relationship between the variables. This is because the value of F-statistic (3.813558) is greater than the upper bound value at 5% (3.49); hence, the need for a long run analysis.

**Table 5: ARDL Long Run Estimation**

Conditional Error Correction Regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.352216	0.501678	-2.695385	0.0195
HDI(-1)*	-0.907164	0.312711	-2.900969	0.0133
TRBL**	0.063006	0.038726	1.626985	0.1297
TRBN(-1)	0.048881	0.035668	1.370455	0.1956
MLDE**	-0.010130	0.039017	-0.259621	0.7996
BLDE(-1)	0.008965	0.012096	0.741206	0.4728
D(TRBN)	0.028699	0.037055	0.774504	0.4536

D(TRBN(-1))	-0.012775	0.028872	-0.442451	0.6660
D(BLDE)	0.017195	0.015971	1.076670	0.3028
D(BLDE(-1))	-0.012948	0.015867	-0.816067	0.4304

\* p-value incompatible with t-Bounds distribution.

\*\* Variable interpreted as  $Z = Z(-1) + D(Z)$ .

Levels Equation

Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TRBL	0.069454	0.047163	1.472638	0.1666
TRBN	0.053883	0.027298	1.973882	0.0719
MLDE	-0.011166	0.044295	-0.252091	0.8052
BLDE	0.009883	0.014181	0.696929	0.4991
C	-1.490597	0.121630	-12.25517	0.0000

$$EC = HDI - (0.0695*TRBL + 0.0539*TRBN - 0.0112*MLDE + 0.0099*BLDE - 1.4906)$$

**Source:** E-Views Output (2024)

Our long run analysis revealed that only multilateral debt has a negative effect on human development index (HDI) in Nigeria. However, all components of public debt considered (treasury bills, treasury bonds, multilateral debt and bilateral debt) were statistically insignificant too.

**Table: 6 ARDL ECM Estimation**

ECM Regression

Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(TRBN)	0.028699	0.019576	1.466034	0.1683
D(TRBN(-1))	-0.012775	0.021173	-0.603347	0.5575
D(BLDE)	0.017195	0.010195	1.686541	0.1175
D(BLDE(-1))	-0.012948	0.011008	-1.176287	0.2623
CointEq(-1)*	-0.907164	0.185502	-4.890322	0.0004

R-squared	0.662412	Mean dependent var	0.020859
Adjusted R-squared	0.582980	S.D. dependent var	0.063036
S.E. of regression	0.040707	Akaike info criterion	-3.368126
Sum squared resid	0.028170	Schwarz criterion	-3.120161
Log likelihood	42.04938	Hannan-Quinn criter.	-3.309713
Durbin-Watson stat	1.985350		

\* p-value incompatible with t-Bounds distribution.

**Source:** E-Views Output (2024)

The above table shows the co-integrating equation of our Error Correction Model (ECM) has the desire negative (-0.907164) and significant signs (0.0004) signs; thus implying that our model has a correctional ability of about 90.7 percent. In other words, in an event of any distortion in the equilibrium relationship between public debt and the performance of the Nigerian economy, disequilibrium, the speed at which equilibrium can be restored is about 90.7%.

## Diagnosics Tests

All diagnostic test results are contained in appendix A. Accordingly, these results showed that the errors of our model were normally distributed as the probability value of Jarque-Bera statistic (0.489106) is greater than 5% (0.05). It also shows that there is no presence of auto correlation in the analysis as the p-value of Q-statistic are greater than 5%. The results additionally indicated no presence of multicollinearity and heteroscedasticity as the centered VIF values of our multicollinearity test are all less than 10 while the p-value of Chi-square for Harvey heteroscedasticity test (0.6266) is greater than 0.05.

## Discussion of Findings

Given the foregoing, this study has revealed a lot, the following will be discussed here. Firstly, it was observed that amongst treasury bills, treasury bonds, bilateral and multilateral debts sources, the Nigerian government has borrowed more via treasury bills, followed by multilateral sources, treasury bonds and bilateral sources. This on the part of the Nigerian government may be down to the low cost associated with treasury bills while on the part of the Nigerian public, it may be down to short term nature of treasury bills and the fact that they are allowed to quote the rates they will like to be paid. Secondly, the study revealed that both in the short and long run, treasury bills, treasury bonds and bilateral debts have positive effects on Nigeria's human development index while only multilateral debt has a negative influence on HDI in Nigeria. This may be down to the complex nature of multilateral debts in terms of payment structure, cost of borrowing and other logistics involved. However, none of the considered classes of public debt considered (treasury bills, treasury bonds, bilateral debt and multilateral debt) has a statistically significant effect on HDI in Nigeria. This may not be unconnected with the high level of waste, mismanagement, corruption and inefficiency associated with the Nigerian public sector whereby borrowed funds, sooner or later, finds its way into private pockets. The purposes for which these funds are borrowed in the first place get defeated. As infrastructure based loans, these loans are expected to repay itself from the revenue they are expected to generate but with such high level of mismanagement, the country ends up having huge infrastructural deficits. At the end of the day, huge sums are mapped out from the country's slim revenue to service such unfruitful loans. For instance, #2.45 trillion was spent in debt servicing in 2019 out of a total revenue of #4.1 trillion; which represents 59.6% debt servicing to revenue ratio. Thirdly, it was observed that public debt has a long run equilibrium relationship with the performance of the Nigerian economy, whereby in an event of disequilibrium in the relationship between public debt and economic performance, public debt related policies has the ability to restore equilibrium to the tune of about 90.7%. In essence, the absolute value of ECM(-1) term showed a 90.7 percent speed of convergence to equilibrium, which is the restoration power of public debt towards ensuring that the Nigerian economy performs optimally. Finally, diagnostic test results revealed that the errors of our model were normally distributed while there were no presence of autocorrelation, multicollinearity and heteroscedasticity in our analysis. This implies that the errors mirror a normal distribution; there is no correlation between successive values of the errors, whereby the error term for one observation was not influenced by the error term of other observations; the explanatory variables are uncorrelated with each other, that is there is no presence of linear or near linear relationships among the explanatory variables; and finally, the error are homoscedastic and not heteroscedastic, which mean the errors have a constant variance.

## CONCLUSION AND RECOMMENDATIONS

### Conclusion

This main aim of this work was to empirically examine the nexus between public debt and the performance of the Nigerian economy between 1990 and 2021. Accordingly, public debt was represented using outstanding values of treasury bills and treasury bonds, bilateral and multilateral debts; while human development index was used as a proxy to measure the performance of the Nigerian economy for the period. This led to the formulation of four specific objectives, research questions and hypotheses respectively. Accordingly, this study adopted quantitative and descriptive research design using already existing data to provide empirical answers to the formulated research questions. These data were sourced from the statistical bulletin of the Central Bank of Nigeria (CBN) and the World Bank. The collected data was robustly analyzed in terms of descriptive analysis, unit root test, ARDL and ECM estimations, co-integration analysis, and diagnostic tests which checked for the normality of the data and the presence of autocorrelation, multicollinearity and heteroscedasticity. These whole analyses and tests were powered by advanced software called E-Views, version 10. Results from the above analyses revealed the following:

- a) With respect to the sources of foreign debt considered, the Nigerian government for the period 1990 to 2021 borrowed more money via treasury bills, which stood at an average value of #1280.478 billion.
- b) The average value of human development index (HDI) in Nigeria for the said period is about 0.468, which falls below the mid-point of 0.5, on a scale of 1-10.
- c) Unit root test result revealed that all the variables were integrated of order zero or one.
- d) Treasury bills and treasury bonds and bilateral debts have positive effects on HDI in Nigeria both the short and long runs while only multilateral debts have a negative influence on HDI in the long and short run.
- e) None of the considered components of public debt has a significant relationship with human development index in Nigeria for the period studied
- f) There were no presence of autocorrelation, multicollinearity and heteroscedasticity in the analysis while the errors were normally distributed.

The foregoing has revealed that none of the components of public debt considered was statistically significant at 5% level of significance. However, only multilateral debt has an inverse association with the human development index of Nigeria. On this backdrop, it can be concluded that there has been a positive but insignificant nexus between public debt and performance of the Nigerian economy over time. This position however agrees with the theoretical postulation of the debt overhang hypothesis, which states that large borrowing leads to high debt, debt traps and slowing down of economic growth. Our position also aligns with the empirical position expressed by the likes of Yusuf and Mohd (2021), Ajayi and Edewusi (2020), and Matthew and Mordecai (2016).

### Recommendations

- i. The first point of call is to ensure that the country comes up with strong laws that will deter public office holders from embezzling public funds and punish those who venture into such



acts decisively. Thus, the onus lies with the so called legislators to enact appropriate laws as it is done in other countries and as well strengthen the legislative arm of government to enable them punish law breakers as expected.

- ii. The government should be transparent in her dealings with Nigerians. In essence, there is need for all loan arrangements to be made open to give room for cross fertilization of ideas and public opinion on the suitability of such loans. This is because no man is an encyclopedia of knowledge.
- iii. There is need for proper scrutiny before embarking on any form of borrowing. This is because history has shown that most public officers mastermind loans on behalf of the country for their own selfish gains. They blindly accept all the terms and conditions given by these lenders without minding the long run consequences of their actions on Nigerians.
- iv. To avoid dependency of any sort and mortgaging the future of unborn generations, the government should take the hard decision of placing an embargo on all forms of borrowing while coming to the drawing board with think tanks and technocrats on possible internal solutions. This no doubt will bring out the creative and innovative abilities of all those involved on ways of meeting government expenditures with borrowing.

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