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## DOMESTIC DEBT FUNDING ELEMENTS AND PUBLIC WORKS EXPENDITURE IN NIGERIA

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### Abstract

This study examined the relationship that subsist between Domestic Debt Funding Elements and Public works Expenditure in Nigeria for the period under study (1987 - 2023), utilizing secondary data. Treasury Bills (TB), Treasury Certificates (TC) and Development Stock (DS) are explanatory variables while Public Works Sector Expenditure (PWE) is the dependent variables used to measure Domestic Borrowings in Nigeria for the period under review. From the result of the study all employed variables on the model are stationary at first difference and exhibited a long-run relationship. From the output of model, it was discovered that all employed variables are positive and statistically significant. but treasury certificate was positive and insignificant to public works

sector expenditure. We therefore recommended that Government should source for more funds with treasury certificates in order to have the needed suitable funds for infrastructural financing and chunk of domestic borrowing should be deployed to this sub-sector to ensure adequate supervision as well as monitoring and maintenance of public utilities. Finally, government should make known to the public the benefits of domestic borrowing as it leads to economic development.

## Keywords

Domestic Debt, Public Works, Treasury Bills.

## INTRODUCTION

Debt is created by act of borrowing and is a liability to an individual, firm or country must have to repay on maturity or future date. In Nigeria, domestic Government debts are contracted by the Federal Government as well as state or local Government dominated in local currency (Adofu and Abula, 2010). Due to the uneven distribution of natural resources that created scarcity, securing internal or external debt becomes inevitable for any government when the economy faces financial crisis as sustainable economic growth is a major concern for any sovereign nation, most especially the Less Developed Countries (LDCs) which are characterized by low capital formation due to low levels of domestic savings and investment. Particularly, Nigeria's domestic borrowing is aimed at escaping the dangers associated with external borrowings occasioned by rising government expenditures in relation to falling government revenues; supplement the internal savings for productive activities through infrastructural development as well as management of other macroeconomic conditions of the country and internal debt became a burden to African countries especially Nigeria when there was a collapse of oil prices in the international market in 1981 (Ajayi, 1989). Nigeria has not been alone in experiencing escalating levels of government domestic indebtedness, but in comparison to other countries in Sub-Sahara Africa, Nigeria's domestic debt to GDP ratio is clearly on the high side. The outstanding

level of government domestic debt has grown tremendously from N28.4 billion in 1986 to N477.7 billion in 1995, reduced in 1996 and started rising again in 1997. Domestic debt stock fell significantly from N4.13 trillion in 2007 to N2.32 trillion in 2008. It increased to N5.62 trillion in 2018 and was at N7.12 trillion as at end of 2019. The trend may continue as statistics obtained from (DMO, 2020) has its own records that total public debt portfolio rose by 0.41 per cent to N12.11 trillion as at 2019. The current rising domestic debt profile in Nigeria is indeed a cause for concern more so, because much borrowed funds are diverted to fund unproductive ventures and private purse; while some states government borrows to pay salaries and other recurrent overheads (James, 2006). It is usually expected that as countries expand their output, they also tend to rely more heavily on domestic public debt issuance to finance. According to (Alison, 2003) Domestic government debt instruments like Treasury bills, Treasury certificates and Development stocks has played an important role in any economy like Nigeria as they provide short and long term funding for the government to carry out some infrastructural sector projects.

There is a general view that public infrastructure like public works can be promoted for growth enhancing and helps reduce unemployment (Agenor and Morenor-Dodson, 2006). Public expenditure as a percentage of GDP increased between the period 1995-1999 from 11.9% to 12.6% in the 2000-2004 periods, down to 12.4% in 2005-2009 and to 6.6% in 2010-2014. In the year 2013, the Federal Government proposed to spend N543 billion on promoting domestic debts servicing out of N592 billion total debt service cost, yet domestic debt stock has increased to approximately N7.12 trillion as at the end of 2014. Total expenditure for 2018 is projected at 8.61 trillion with expected revenue of 6.61 trillion resulting in a deficit of 2.0 trillion. This represents a nominal increase of approximately 16 per cent over the 2017 budget estimates of 7.44 trillion. Ministry of power, works and housing is poised to receive the highest capital allocation with budget of 555.9 billion followed by the ministry of transportation comes with projection of 263.1 billion.

Public works programmes are a means of creating a high volume of employment in the short-term in a situation of chronic unemployment and underemployment, and a way of responding to crisis situations. Public works programmes can act as a shock treatment, creating a substantial number of mainly unskilled jobs for the totally unemployed or those underemployed part of the year. These programmes assist populations to cope with emergency situations such as in times of disasters (floods, drought) and acute political and social crises (Amelita 1996). According to Charles (2012) Nigerian economy is still characterized by low per capita income, high unemployment rates, dwindling economy, inadequate basic amenities and poor infrastructural development and falling growth rates of GDP. The reliance by the federal government on borrowing from the banking system, particularly the CBN, to finance its large and unsustainable fiscal deficits has affected the growth of the Nigerian economy negatively. This has hindered the attainment of macroeconomic stability and sustainable economic growth in Nigeria. In addition, it has crowded out the private sector from the credit market, thereby stalling investment and output growth. It is against this backdrop that this study set out to examine the structure of domestic debt funding elements and public works expenditure in Nigeria.

### **Statement of the Problem**

Generally, despite the various efforts made by the government to rationalize public expenditure much success has not been achieved in reducing its spending and this has continuously raise the size of domestic debt and the identified factors are high budget deficit, high inflation rate, low income growth, substantial consumption increase and poor infrastructural development (Gbosi, 1988); Rapu (2003); Asogwa (2005). However, domestic debt profile in Nigeria is indeed a cause of concern because much borrowed funds are diverted to fund unproductive ventures while some state government borrow to pay salaries and other recurrent overheads and also the current unabated security challenges like the Boko-Haram insurgency and the high level of corruption to the country's political leaders. According to Sansui (1988) domestic borrowing problem ranges from project financing mismatch, nature of the economy, inappropriate promotion of monetary and fiscal policies put in place by the government. He also find out that domestic debt markets in Nigeria generally are small, highly short term and often have narrow investors base and interest payment present a significant burden to the budget and crowd out effect on private investment.

Given the above, in view of this, we tried to find out how domestic debt elements have contributed to the finance of public works expenditure in Nigeria.

### **Aim of the Study**

The aim of this study is to examine the relationship between domestic debt funding elements and public works expenditure in Nigeria

Specific objectives, seeks to:

- i. Evaluate the relationship between treasury bills and public works expenditure in Nigeria.
- ii. Investigate the relationship between treasury certificate and public works expenditure in Nigeria.
- iii. Evaluate the relationship between development stock and public works expenditure in Nigeria.

### **Research Hypotheses**

The following hypotheses were formulated in their respective null forms

**Ho1:** Treasury bills do not have significant relationship with public works expenditure in Nigeria.

**Ho2:** There is no significant relationship between treasury certificates and public works expenditure in Nigeria.

**Ho3:** Development stock does not have significant relationship with public works expenditure in Nigeria.

### **Theoretical Framework**

This study employed two theories for clarity and understanding. Firstly, the Adolph Wagner made an in depth study concerning the rise in government expenditure in the late 19<sup>th</sup> century. On his study, he propounded a law called “The Law of Increasing State Activity”. Wagner’s law states that “as the economy develops over time, the activities and functions of the Government increase”. Wagner’s Statement Indicates Following Points:

1. In progressive societies, the activities of the central and local government increase on a regular basis.
2. The increase in government activities is both extensive and intensive.
3. The governments undertake new functions in the interest of the society.
4. The old and the new functions are performed more efficiently and completely than before.
5. The purpose of the government activities is to meet the economic needs other of the people.
6. The expansion and intensification of government function and activities lead to increase in public expenditure.

7. Though Wagner studied the economic growth of Germany, it applies to other countries too both developed and developing.

The primary reactions of Wagner's law have concerned his perspective of history and of the relationship between the state and its subjects. Peacock and Wiseman additionally questioned whether Wagner's thoughts could be connected to all social orders at all times and proposed that the time example of genuine public expenditure development did not fit well with Wagner's law.

Secondly, this theory was propounded by Peacock and Jack Wiseman in Great Britain from 1890-1955 and advanced the study of growth of public expenditure called Peacock Wiseman hypothesis. They took this study in light of Wagner's Law and found out that Wagner's Law is still valid. Peacock and Wiseman further stated that:

1. There has been an increase in public expenditure due to high revenue generated to economic development over the years.

2. The government simply cannot ignore the demand that people made regarding various services, especially when there is an increase in revenue collection at a constant rate of taxation.

3. They further stated that during the times of war, tax rates are increased by the government to generate more fund to meet the increase in defence expenditure after the war, the new tax rates and tax structures may continue as before. This is known as displacement effect.

Therefore, both theories: Wagner's law and Peacock-Wiseman hypothesis emphasize on the fact that public expenditure has tendency to increase overtime.

## **Conceptual Framework**

### **An Overview of Nigerian Domestic Debt**

In Nigeria, domestic government debt is defined as debt instruments issued by the

Federal government and denominated in local currency. Or debt owed to lenders within the country. In principle, State and Local governments can also issue debt, but they are still limited in their ability to issue debt instruments. Therefore a domestic government debt consists of:

1. Nigerian Treasury Bills
2. Nigerian Treasury Certificates
3. Federal Government Development Stocks
4. Treasury Bonds
5. Ways and Means Advances

Out of these, treasury bills, treasury certificates and development stocks are marketable and negotiable, while treasury bonds, ways and means advances are not marketable, but held solely by the CBN. Of the three marketable government debt instruments, only treasury bills are currently traded in the money market, since treasury certificates was discontinued in 1996. Development stocks are traded in the capital market, but since 1987, the federal government has not issued any new development stock. The beginning of the existing market for domestic government debt in Nigeria is the financial reforms introduced by the colonial government in 1958. These reforms saw to the creation of the Central Bank of Nigeria (CBN) and the creation of marketable public securities to finance fiscal deficits. According to paragraph 35 of the CBN ordinance 1958: "The Bank shall be entrusted with the issue and management of federal government loans publicly issued in Nigeria, upon such terms and conditions as may be agreed between the federal government and the Bank." The Central Bank in the course of discharging its functions with respect to debt management plays an important role in both the primary and secondary markets for government securities. In the primary market, the Central Bank readily guarantees the issue of these securities and absorbs any amount not subscribed by the banks and the non-bank public. Thus even if the non-Central Bank subscriptions were zero, 'mandatory take-up' guarantees the government the full amount of any issues of treasury bills, treasury certificates or development stocks required to finance its budget. The CBN also provides a secondary market for government securities whereby those securities held by the Bank are offered to the public for sale (Alison ,2003.) Domestic government debt instruments play an important role in any economy, as they provide economic agents with alternative options to banking for allocating their

savings accordingly. It is a key part of the collateral used in financial markets and as such plays an important role in monetary policy implementation. Significant changes in the size, structure and composition of government debt instruments may influence financial stability. In order to maintain financial stability, it is therefore important to monitor the structure, characteristics and the level of risk inherent in the debt portfolio. Reliable statistics on the composition, investor's base and maturity structure is necessary to assess these risks.

Nigeria's Medium-Term Debt Management Strategy (MTDS), 2020-2023, is formulated to guide the borrowing activities of the Government in the medium-term. The framework compares alternative funding strategies available to Government as it pursues the desired structure of debt portfolio that reflects the selected strategy considering the costs and risk trade-offs in the medium-term. DMO (2023)

**Treasury Bills:** is a short term debt instrument issued by the federal government through the Central bank of Nigeria to provide short term funding for the government. They are by nature, the most liquid money market securities and are backed by guarantee of the federal government. They are usually issued for tenors of 91 days, 182 days and 364 days a year at the primary market auction held fortnightly by the CBN. Treasury bill constitute the main component of the outstanding stock of government debt accounting for 77.4 per cent of total domestic debt in 1960, declining to 51 percent by 1970 but climbing up to 62 percent in 2003. The decline in the percentage share of treasury bills in the mid 1970's was as a result of the decision not to issue new treasury bills because of the boost in government revenue in the mid 1970's as revenue from the oil



sector improved substantially. As soon as there was a decline in revenue from this source, government reliance on credit from the CBN through the issue of treasury bills resumed as from 1981. The growth in the level of treasury bills also reflected the practice of rollover of maturing securities and continuous recourse to conversion of ways and means advances outstanding at the end of the year to treasury bills as a way of funding the fiscal deficit. Treasury bills is a risk free investment as it carries the guarantee of the federal government, it can be used as collateral and it is a discount instrument enabling the investors to earn interest upfront.

**Treasury Certificates** Which were first issued in 1968, constituted one of the largest securities between 1983 and 1988. It even surpassed treasury bills between period 1976-1980. It was first issued to further deepen the domestic money market by increasing short term investment options available. In 1995, the federal government decided to convert treasury certificates outstanding to non- tradable treasury bonds in an attempt to further reduce its debt service obligations on domestic debt. Treasury certificates were therefore abolished in 1996. Flotation of treasury bills and certificates introduced treasury bonds, as another instrument in the portfolio of domestic debt. The objective was to minimise debt service obligations on domestic debt arising from the liberalization policies. Thus in 1989, 20 million Naira worth of treasury bills, representing 58.6% of treasury bills outstanding were converted to treasury bonds of fixed interest rates. The bonds styled as “ 5% Federal Republic of Nigeria treasury bonds 2004-2015” are to carry a fixed interest rate of 5% and are wholly held by the CBN. As a result of the flotation of new issues of treasury bonds and conversion of part of the treasury certificates outstanding, treasury bonds accounted for up to 69% of total domestic debt as at end 1996.

**Development stocks** were apparently the first government instrument to be issued. It was floated largely to provide development finance either directly to meet the needs of the federal government or as loan on lent to the state governments. The colonial administrators floated the first registered debt stocks 1956/61 in 1956. Development stocks outstanding increased between 1960 and 1987. It started to decline as from 1988, as no new stocks were made. The Development Stocks were traded in the secondary market of the Nigerian Stock Exchange. In line with government’s policy of reducing reliance on monetary financing of deficits, the federal government through the Debt Management Office (DMO) in 2003 raised funds through the capital market to meet its financing needs by issuing the 1<sup>st</sup>FGN Bonds. The government was able to raise N72.6 billion, out of the N150 billion worth of bonds issued representing about 5.4% of total domestic debt stock.

### **Reasons for Domestic Borrowing**

Borrowing may be considered as a second-best alternative to money creation during periods of unemployment. In this way, it is seen as an instrument of managing the economy. Domestic loan is also seen as a means of filling domestic savings gap especially in the face of dwindling government revenues from domestic source.

Theoretically, there are three often reasons for government borrowing (Alison et al, 2003) The first is for Budget deficit, the second is for implementation of monetary policy (by buying and selling of treasury bills in Open market Operation) and the third is to develop financial sector (supplying tradable financial instruments so as to deepen the financial markets in Nigeria. Several factors have

also contributed to domestic debt profile between the 1960s and now (Rapu.2003) the major factors include large expenditure growth, low output growth, high inflation rate and narrow revenue base. In Nigeria, several factors have been to explain the changing domestic debt profile and repayment between 1960s till date. In order to improve on the standard of living of its populace and also for sustainable economic enhancement; government issues domestic debt instruments in the bid to source for funds to carry out some infrastructural sector projects. There cannot be substantial development without the growth of economy.

While explaining the reasons for increasing public debt on the part of government came up with the following reasons: (1) government borrows to finance emergencies such as natural disasters and economic depression (2) government borrows to finance important capital projects such as water dams, agricultural development projects, and river basin development projects and, (3) government borrows to finance reasonable revenue collection.

Generally, declines in government revenue were met by borrowing from the central bank through the instrument of ways and means advance and this has contributed to the continued growth of the debt stocks. Currently, the unabated security challenges (like the Boko-haram insurgency) and the high level of corruption of the country's political leaders have contributed to the increase accumulation of domestic debt of the federal government.

### **Effective Management of Debt**

For an effective management of public domestic debt in a developing country like Nigeria the following measures may be useful:

An accurate and comprehensive knowledge of the debt in terms of its size, composition maturity, historical evolution, debt services and future evolution is indispensable for effective management of public domestic debt. This is necessary to ensure that individual creditors are paid promptly as well as in assessing current future debt service obligations. In addition, there should be a relatively longer length of time for rescheduling so as to defray the domestic debt and hence revive the economy. Budgetary controls and financial accountability must be established in the public sector by making it mandatory for government departments, ministers and parastatals to publish their audited annual accounts within 3 months of the end of their respective fiscal years. This would help restore financial discipline and thus minimize the misappropriation and waste of funds. It will also provide the up-to-date data needed for meaningful policy discussions and efficient debt management. Both federal and state governments (where applicable) should strive at achieving and maintaining balanced budgets given its inherence financial discipline. Also, public and private sector borrowing should be reduced by more effective tax collection and administration. The procedure for controlling internal loans must be tightened to put an end to the practice of indiscriminate internal borrowing of various state governments without prior approval from the federal government. Provision should be made for all projects financed with banks and contractor's loans to be centrally monitored for problems solutions and progress. Furthermore, the timing of borrowing should be known and this should be when a country's credit worthiness is rated high in international capital markets, when the loan is readily available and at more favourable and less onerous terms.



It is obvious that domestic debt begets infrastructural financing in Nigeria. Thus, the federal government has embarked on a number of sector reforms with a view to diversify the economy away from crude oil and boosting productivity in agriculture and solid minerals. It has also committed to developing key infrastructure projects in power and transportation (road, rail and aviation). The new policy focuses on the utilization of all the borrowed amounts to fund the budget deficit and the amounts would be specifically allocated to fund identified infrastructure projects. Efforts are also made to improve governance and efficiency in fiscal operations of the government so as to reduce wastages and leakages. ( DMO, 2020).

The Government, in its Medium-Term Expenditure Framework (MTEF), 2017-2020, envisages generating a real GDP growth rate of 4.4 per cent in 2016, with a gradual increase to 5.1 per cent by 2019; while keeping the inflation level under control at slightly above 9 per cent annually. Oil revenues and related foreign exchange proceeds are expected to show only a modest increase leading to a continued, but more gradual decline in international reserves. The MTEF, 2017-2020 and the 2019 Budget give room for fiscal expansion with conservative revenue estimates. This would create funding gaps much of which would have to be covered through debt. The purpose of the Debt Management Strategy analyses is to explore hoe to optimally fund (i.e. the difference between revenue and expenditure estimates), thus created in view of the several funding sources and debts instruments available to the government.

### **Concept of Infrastructure**

It has long been recognized that adequate supply of infrastructure services is an essential ingredient for productivity and growth in any economy. In recent years, the role of infrastructure services have received increased attention. Much of the current international debate on ways to spur growth, reduce poverty, and improve the quality of human life in low-income developing countries has been centred on the need to promote large increase in public investments in infrastructure. Report by the World bank (2005) have dwelt on the importance of a “Big Push” in public investments in core infrastructure, financed by generous debt relief and a substantial increases in foreign aids (Agenor and Moreno-Dodson, 2006). Infrastructure has become a ubiquitous theme in a variety of areas of the policy debate. For instance, there is persuasive evidence that adequate provision of infrastructural facilities is a key element in the agenda required for an economy to achieve its intended objectives of efficient resources allocation and growth. Also, a number of studies (Adesoye, Maku and Atanda, 2010; Agenor and Moreno-Dodson, 2006) have argued that generalized access to infrastructure services plays a key role in helping reduce income inequality (World Bank, 2003). There is general view that public infrastructure expenditure, either recurrent or capital expenditure, notably on social and economic infrastructure like transportation and communication can be growth-enhancing, although the financing of such expenditure to provide essential infrastructural facilities-including transport, electricity, telecommunications, water and sanitation, waste disposal, defence, education and health-can be growth-retarding (for example, the negative effect associated with taxation and excessive debt). Adesoye, Maku and Atanda, 2010. A common argument for a large increase in public spending on infrastructure is that infrastructure services may have a strong growth-promoting effect through their impact on the

productivity of private inputs and the rate of return on capital— particularly. To begin with, stocks of infrastructure assets which are relatively low. In that regard, low-income countries like Nigeria are at a particular disadvantage. In Sub-Saharan Africa for instance, only 16 percent of roads are paved, and less than one in five Africans has access to electricity. The average waiting time for a fixed telephone connection is three and a half years. Transport costs are the highest of any region, (Agenor and Morenor-Dodson, 2006).

**Public works** are broad category of infrastructure projects, financed and constructed by the government, for recreational, employment, and health and safety uses in the greater community. They include public buildings, schools, hospitals, highways, public spaces (public squares, parks, beaches), public services (water supply and treatment, sewage treatment, electrical grid, dams), and other, usually long-term, physical assets and facilities. Though often interchangeable with public infrastructure and public capital, public works does not necessarily carry an economic component, thereby being a broader term. Public works has been encouraged since antiquity (Ahmad, 2008). While it is argued that capital investment in public works can be used to reduce unemployment, opponents of internal improvement programs argue that such projects should be undertaken by the private sector, and not the public sector, because public works projects are characteristic of socialism. However, in the private sector, entrepreneurs bear their own losses and so private sector firms are generally unwilling to undertake projects that could result in losses or would not develop a revenue stream. Governments will invest in public works because of the overall benefit to society when there is a lack of private sector benefit (a project that will not generate revenue) or the risk is too great for a private company to accept on its own.

### Empirical literature

Uranta and Lucky (2024) investigates the relationship between domestic debt and infrastructural financing of public transportation expenditure in Nigeria from 1986 to 2023. Time series data were sourced from Central Bank of Nigeria Statistical Bulletin, Nigeria Bureau of Statistics and Debt Management Office. Public transportation expenditure was used as dependent variables while Treasury Bonds, Treasury Bills and FGN Bonds are the independent variables. The study employed Unit Root, Co-integration, Error Correction Model and Granger Causality techniques in analysing secondary data. The unit root test revealed that Domestic Debt and transportation expenditure were integrated as order 1 or I (1), meaning it is non-stationary at original level. The estimated model found that 63 per cent variation in public expenditure on transport was detected from the domestic debt variables; the model is statistically significant by the value of f-probability. The results further found that federal government Treasury bond have positive effect while treasury bills and federal government bonds have positive effect on public expenditure on transport. From the findings, we conclude that domestic debt affects the growth of public expenditure on transportation. We recommend improve fiscal discipline and efficiency in public spending to ensure that funds allocated for infrastructure projects are used effectively. Implement robust project appraisal, monitoring, and evaluation mechanisms to reduce wastage and corruption in public spending. Given the bidirectional causality between transportation Expenditure and FGN Bonds, prioritize healthcare financing to meet the growing healthcare needs of the population. Explore

ways to enhance healthcare infrastructure and service delivery without overreliance on debt financing.

Nworji and Oluwalalaye (2012) examined 'Government Spending on Road infrastructure and the effect on the Growth of Nigerian Economy explored the effect of government spending on road infrastructure enhancement on economic increase in the economy of Nigeria ranging from 1980-2009 periods. The study utilized multiple regression model determined on the premise of hypothesized practical relationship between government spending on infrastructure improvement and growth of the economy. The pointers used for government spending arc qualities for protection, transport/communication, and rate of inflation as the independent variables, while GDP constituted the dependent variable. The model for the study was assessed utilizing the Unit Root Test method, and further assessment done utilizing the coefficient of determination to clarify the difference between the independent and dependent variables. The results demonstrated that transportation and communication, including defence, exclusively applied significant effect on the economic growth; on the other hand, inflation proved to be positive in the periods under study. Nonetheless, the 'variables mutually showed significant effect on economic growth. Moreover, the model showed a high explanatory power. In view of the findings the study prescribed that better co-ordination in the terms of private inclusiveness in funding and repair of road infrastructure framework could enhance economy growth

Araloyin and Baogun (2017) Examines Infrastructure Finance system: A comparative analysis of developing countries a lesson for Nigeria .The current level of infrastructure deficit in Nigeria is believed to be one of the major constraints towards achieving national economic development. This study looks into three emerging economies - India, Brazil and Chile and identifies solutions that may be applicable to infrastructure financing in Nigeria. The study found that the Nigerian system runs in a similar way to that of India and Brazil, in that the public sector plays a major role in the provision of funds for infrastructure in the country. In Chile, privatization is the main means by which the government has improved on infrastructure financing. Going by Chile's experience, privatization seems to be the best option for Nigeria because it devoid the evil of corruption and mismanagement which appears to be the bane of infrastructure development in the country. However, privatization in Nigeria should be practiced (like Chile) on transparency, openness, dialogue and decision-making processes for achievements to be recorded

Ette, Azubike and bartholomew (2015) examine the Nigerian Treasury bills Rates Forecasting Model from 2006-2014 which reveals an overall down trend from 2006-2009 followed by an upward trend up to 2013. Augmented –dickey fuller, unit root test, treasury bills and seasonal differencing which are non-stationary while seasonal auto-gressive moving averages is stationary. The correlation of seasonal auto-gressive moving averages has a negative significant in the autocorrelation function at Lag 12, an indication of seasonal period 12 months and the presence of seasonal moving average component of order 1. This model is fitted and has been shown to be more adequate and may be used to forecast future Nigerian treasury bills

James (2013) on his study 'Financing Urban Infrastructure: Known, Unknowns and a Way Forward' suggested that improved urban infrastructure is generally accepted to be crucial in encouraging economic growth and in enhancing the lives of people living in the urban areas, both in first world countries and in third world countries. This paper concentrates on a few measurements of urban infrastructure finance: money for significant infrastructure enhancements in major economic centres, fund for extension of essential metropolitan services in secondary cities and towns, and intergovernmental frameworks for financing investments with effects past jurisdictional limits. It surveys what is "known" about current practices in these areas, utilizing international evidence and contextual analyses and abridging international best practices. It additionally shows areas in which learning gaps remains, Regardless of these "unknowns," there are avenues by which our comprehension of infrastructure plans can be upgraded.

Adesoye. (2014) examined, 'Infrastructural Financing in Nigeria: Growth Implications' critically analyses the effects of financing of infrastructure on economic growth in Nigeria within 1970 -2010. The OLS method is used to estimate the empirical model on government infrastructural spending base on function. The result of analysis revealed that government community service infrastructural spending, private infrastructural investment, broad money supply, and total population exert positive influence on economic growth while government economic service infrastructural spending and total domestic and external debt exert negative effects on economic growth in Nigeria

Iwedi and Onuegbu (2014) Investigates 'Funding Housing Deficit in Nigeria: A Review of the Efforts, Challenges and the Way forward', investigated the efforts and difficulties of financing housing shortfall in Nigeria and the path forward. They have distinguished a few difficulties to incorporate lack of apportionment of funds or poor subsidizing, obsolete mortgage loan laws or poor mortgage loan framework, unpleasant consistence with the National Housing Fund plan among others. The study reasoned that satisfactory funding by means of apportionment or getting help from the international community feasible mortgage framework and implementation of government policy are irreplaceable instruments for bridging the housing deficiency in this area of the economy of Nigeria and posited amongst others that government ought to work in conjunction with the private sector and international community to contribute for procurement of funds for efficient housing provision for Nigerians. Then government at all levels ought to make it easy for acquiring and the issuance of the occupancy certificate.

Samson and Jonathan (2010) examined 'The Effects of Debt Burden on the Nigerian Economy'. The work was to ascertain the impact of debt burden on the Nigerian economy. It specifically sought to establish the effect of debt burden on the growth of the Nigerian economy. Data was sourced from the CBN Statistical Bulletin volume 18, (2007) during the period 1970-2007 was used. Ordinary least squares (OLS) was used to test the relationship between debt burden and the growth in the Nigerian economy. From the finding there was a negative relationship between debt stock (internal and external debt) and gross domestic product, which means that an increase in debt stock will contribute to a reduction on the growth rate of Nigerian economy. It was recommended that the nation should avoid both external and internal borrowing in order to avoid huge debt

Jude and Ekundayo (2014) in a study, Financing Capital Investments in Nigeria: The Role of the Banking Industry opined that a developing nation like Nigeria needs huge capital to finance the needed infrastructures and capital intensive investments that are required in order to run the economy. The research emphasis on whether the banking sector is actually funding capital intensive investment thus put in enormously to the expansion of the Nigerian economy. And as well as considered the input of banking sector in supporting the expansion of the capital market thereby making funds available that would improve manufacturing of goods. The data collected were analysed with regression using e-view software. It was discovered that the banks have funded much in financing capital investments and stock market development in Nigeria. Moreover, it was recommended that financial institutions should be encouraged to make more funds for available to lend that will assist investments that are capital intensive in nature. The Central Bank should as well decrease rediscounting rate to the minimum.

Ogunlana and Yaqub (2016). In their study, Infrastructure Finance and Development in Nigeria. of the view that development in whatever dimension cannot result into good healthy living if infrastructure such as telecommunications, transport, energy, water, health, housing and education are not invested on. As such, financing of infrastructure project is expected to yield positive externality on economic growth and welfare of the people. This study analysed the effect of public and private investment on infrastructures and its impact on economic growth in Nigeria during the period 1970 to 2014 using the Engle-Granger (1987) cointegration and Error correction mechanism (ECM) were employed to analyse the unit root procedures, ascertain the long run relationship and establish the values of long run parameters. Empirical results show that infrastructure components exert positive contribution on economic growth in Nigeria. Domestic investment on infrastructure and total labour force correlated with economic growth negatively. Nigeria's experience in terms of infrastructure development show

Ademola and Oluwaseyi (2013), in their investigation of the relationship between 'domestic debt, macro-economic indices and viability, of the Construction segment in Nigeria', coordinated at establishing relationship between domestic debt, macroeconomic indices and the feasibility of the construction sector of Nigeria economy with a perspective to start empirical model for financial investor's choice making. They utilized archival data on financial and monetary macroeconomic measures; for example, unemployment rate; exchange rate; inflation rate; interest rate; domestic debt and the contribution of the construction segment to the GDP between years 2001-2011 were gathered from Nigeria Bureau of Statistics (NBS) and Central Bank of Nigeria (CBN). The data were dissected utilizing multiple regression analysis to build up the relationship that exists between the distinguished fiscal macroeconomic variables. The examination uncovered that the adjusted R<sup>2</sup> of 0.629 or 63.0% of the Construction Sector (represented by Construction industry segment GDP growth rate (GDP) was clarified by the chose macroeconomic variables. The study conclusion benefit for long-run behaviour of the economy and difficulties of investment decision as it influences construction business; it prescribed that fitting direction and comprehension of macroeconomic approach is needed by speculators and policy makers for choice making and drawing investment to the construction sector of the Nigerian economy.



Oye and Kadom (2016) on their study, Evaluating the role and impact of railway transport in the Nigerian economy, options and choices: Case of Nigerian Railway Corporation Efficient railway transport enhances the economic development of any country, in terms of the movement of people and goods from one destination to another. Nigeria is an oil producing country, yet the supply chain of the petroleum product distribution is poor, inefficient, and abysmal let alone effective. The distribution of petroleum products is done through the road haulage system which equally drives up the distribution cost as well as an increase in the pump price. Inefficient product distribution results in delays in the petroleum products reaching the filling stations quicker which sometimes lead to product shortages and results in fuel scarcity and fuel queues at filling stations. Nigerian Railway Corporation (NRC) was therefore established by the Act of 1955 (amended by 1990 Act) for the sole aim of moving of passengers and haulage of freight and given the monopoly power and exclusive right for this purpose. Although development and construction of the railway track started as far back as 1898 and over years, numerous amounts of money invested on the rail system in Nigeria have also seen little impact. NRC is currently saddled with the problem of dwindling revenue; operational costs are increasing, as is the mounting debt. There is demand for the services that is currently not satisfied, but due to limited operational capacity, the yearnings of the teeming population for efficient transport system are still not fulfilled let alone effective. The research methodology includes the use of primary data from a virtual survey, analysis of evidence from the empirical study as well as an analysis of secondary data obtained from various published research sources

Okunlola and Ajala (2015) studied infrastructure dilemma (ID) and the need for alternative funding in Nigeria. ID was proxied by capital finances to social and community, economic and, administrative capital finances; while domestic debt represents alternative funding. Time series data from the Central Bank of Nigeria statistical bulletin, economic reports of various issues, National Bureau of Statistics and Debt Management Office DMO from 1970 to 2013 were used. Descriptive statistical tools, OLS, Phillip Perron (PP) unit root test, Johansen co integration and the Error Correction model (ECM) were analysed. The result shows that all the explanatory variables were statistically insignificant as indicated by their  $p = 0.90(\text{Sconfin})$ ,  $0.82(\text{Ecofin})$  and  $0.19(\text{Admnfin})$ . This result is a proof of infrastructure dilemma in Nigeria and urgently calls for attention. The study recommends a project tied based financing, and the exploration of the potentials of the capital market

William et al (2014) examined the impacts of financing public utility with bonds in a developing economy: A co-integration approach. They investigate that Bond has a debt instruments' use to finance capital project by different levels of governments. Public utility such as roads, sea and air ports etc in any economy can be attributed or measured to an extent of the amount of money invested on bonds or the amount of Bond issued to finance public utility. However, Empirical evidences attest to the fact that bond is designed to finance capital projects in advance country but in the case a developing economy the reverse is the case hence making it difficult for business organizations to tap unto this financing window. This research work try to capture the effect of bonds on public utility using infrastructural development as a dependent variable in Nigeria with data from 1980 to 2011. The study applies the co-integration analysis and review that there is a positive linear relationship between bonds and infrastructural development. We also discover that



bonds are statistical significant variables but inversely related to infrastructural development because the issue of bonds by governments in a developed economy has not been tied to a particular public utility.

## Methodology

This study adopted quasi-experimental research design. Secondary data was sourced from Central Bank of Nigeria's Statistical Bulletin (Various Issues), National Bureau of Statistics. The study sought to establish the relationship between the dependent variable: Public Works Sector Expenditure, and independent variables: Treasury Bills, Treasury Certificates and Development Stocks in Nigeria. Based on the theoretical underpinning and the empirical review made by Williams, Okonkwo and Abolore (2014), Charles (2012). We construct and specify that Domestic Debt can be explained by (treasury bills, treasury certificates and development stock). The model thus, is specified in its functional form as follows:

$$PWE = f(TB, TC, DS) \dots\dots\dots (1)$$

For estimation purposes, equation (1) is rewritten as follows;

$$PWE_t = \alpha_0 + B_1TB + B_2TC + B_3DS + E_t \dots\dots\dots (11)$$

Where;

- PWE- Public Works Sector Expenditure
- TB- Treasury Bills
- TC- Treasury Certificates
- DS- Development Stock

$\alpha_0$  = Constant term

$\beta_1, \beta_2, \beta_3$ - The regression coefficients of Treasury Bills, Treasury Certificate and Development Stock.

$\varepsilon_t$  —white noise error at time  $t$

## A priori Expectation

The a priori expectation is stated thus;

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

## Data Analysis Techniques

In time series analysis, the properties of standard estimation and testing techniques depend critically on the assumption that the variables under consideration are stationary. We first of all carry out a unit root test to determine the stationarity or otherwise of the data of study.

**Table 1 Result of Unit Root Test (Using ADF)**

|            | ADF test statistic | Critical Value 5% |           |           | Order of Integration | Prob.  |
|------------|--------------------|-------------------|-----------|-----------|----------------------|--------|
|            |                    | 1%                | 5%        | 10%       |                      |        |
| <b>TB</b>  | -4.571274          | -4.273277         | -3.557759 | -3.212361 | I(1)                 | 0.0047 |
| <b>TC</b>  | -4.451547          | -4.273277         | -3.557759 | -3.212361 | I(1)                 | 0.0063 |
| <b>DS</b>  | -7.446756          | -4.273277         | -3.557759 | -3.212361 | I(1)                 | 0.0000 |
| <b>PWE</b> | -5.776396          | -4.273277         | -3.557759 | -3.212361 | I(1)                 | 0.0002 |

**Source:** *Source: Eview 10 Output (Authors Computation and Compilation).*

From ADF Unit root test result in the table above, comparing the ADF test statistic value with the Critical values at 5% significant level, all the variables are stationary at difference 1(1). This goes to show that all variables have a statistically predictive trend which can be used for subsequent estimation and forecast as they all integrated of order 1(1).

### **Johansen Cointegration Test (Model )**

Date: 14/08/25 Time: 10:28

Sample (adjusted): 1987- 2023

Included observations: 36 after adjustments

Trend assumption: Linear deterministic trend

Series: PWE TB TC DS

Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

| Hypothesized |            | Trace     | 0.05           |         |  |
|--------------|------------|-----------|----------------|---------|--|
| No. of CE(s) | Eigenvalue | Statistic | Critical Value | Prob.** |  |
| None *       | 0.694038   | 100.3261  | 69.81889       | 0.0000  |  |
| At most 1 *  | 0.576663   | 60.06008  | 47.85613       | 0.0024  |  |
| At most 2 *  | 0.355090   | 30.83417  | 29.79707       | 0.0379  |  |
| At most 3 *  | 0.308264   | 15.92025  | 15.49471       | 0.0431  |  |

At most 4      0.094884      3.389526      3.841466      0.0656

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Trace test indicates 4 cointegratingeqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

*Source: Eview 10 Output (Authors Computation and Compilation)*

The table above documents the result of the Johansen cointegration approach to long-run relationship determination between variables incorporated in the model. From the Trace test carried out and reported in the table above, the outcome shows the existence of four cointegration equations in the model. This by inference speaks to the existence of a long-run association between public works expenditure, treasury bills, treasury certificates and development stocks. The existence of a long-run relationship necessitates the conduct of an ECM test in order to ascertain the speed of adjustment of the model

### **Parsimonious Error Correction Test (Model )**

Dependent Variable: D(PWE)

Method: Least Squares

Date: 14/08/25 Time: 10:32

Sample (adjusted): 1987 2023

Included observations: 36 after adjustments

| Variable           | Coefficient | Std. Error         | t-Statistic | Prob.  |
|--------------------|-------------|--------------------|-------------|--------|
| D(TB(-1))          | 45.31619    | 15.30235           | 2.961387    | 0.0077 |
| D(TC(-1))          | 14.22122    | 6.903309           | 2.060059    | 0.0526 |
| D(DS(-1))          | 13.02316    | 5.453472           | 2.388048    | 0.0269 |
| ECM(-1)            | -0.448055   | 0.168180           | -2.664135   | 0.0149 |
| C                  | -19.84615   | 4.868690           | -4.076281   | 0.0006 |
| R-squared          | 0.684410    | Mean dependent var | -0.283871   |        |
| Adjusted R-squared | 0.526616    | S.D. dependent var | 16.35003    |        |

|                    |           |                       |          |
|--------------------|-----------|-----------------------|----------|
| S.E. of regression | 11.24930  | Akaike info criterion | 7.949911 |
| Sum squared resid  | 2530.935  | Schwarz criterion     | 8.458746 |
| Log likelihood     | -112.2236 | Hannan-Quinn criter.  | 8.115779 |
| F-statistic        | 4.337346  | Durbin-Watson stat    | 1.602847 |
| Prob(F-statistic)  | 0.002558  |                       |          |

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*Source: Eview 10 Output (Authors Computation and Compilation)*

The table above displays the outcome of the error correction mechanism (ECM) test conducted revealing that the coefficient of determination is 0.684. At 0.684 the coefficient of determination clearly shows that 68% of alterations in public work expenditure (PWE) are accounted for jointly by treasury bills (TB), treasury certificates (TC) and development stocks (DS). The residual of 32% is accounted for by variables not included in the model but captured by the stochastic term or error term. Careful observation of the aforementioned table disclosed that, treasury bill at lag 1 exerts a positive and significant impact on public work expenditure which is indicative that, increases in credit using treasury bills spurs public work expenditure. Further observation of the short run tendencies or impact of the adopted variables showed that lag 1 of development stock influences current public work expenditure positively and significant. Similarly, treasury certificate at lag 1 exert a positive relationship or impact on PWE although the impact is insignificant. The probability value of the F-statistics given as 0.002 indicates that the model is statistical significant at 5 percent level.

The result of the ECM at 0.448 explains the convergence of the model at a speed of 44%. In view of the above, temporal distortion in the model emanating from the independent variables will be adjusted and return to equilibrium in the long-run at the speed of 44%.

### Pairwise Granger Causality Test

Pairwise Granger Causality Tests

Date: 14/08/25 Time: 10:55

Sample: 1987 2023

Lags: 2

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| Null Hypothesis:              | Obs | F-Statistic | Prob.  |
|-------------------------------|-----|-------------|--------|
| PTE does not Granger Cause DD | 34  | 5.26764     | 0.0112 |
| DD does not Granger Cause PTE |     | 3.76039     | 0.0353 |

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|                                 |    |         |        |
|---------------------------------|----|---------|--------|
| PWE does not Granger Cause DD   | 34 | 3.87613 | 0.0322 |
| DD does not Granger Cause PWE   |    | 3.86707 | 0.0325 |
| PLHE does not Granger Cause DD  | 34 | 1.23132 | 0.3067 |
| DD does not Granger Cause PLHE  |    | 0.01875 | 0.9814 |
| PWE does not Granger Cause PTE  | 34 | 4.77907 | 0.0161 |
| PTE does not Granger Cause PWE  |    | 20.2764 | 3.E-06 |
| PLHE does not Granger Cause PTE | 34 | 6.42529 | 0.0049 |
| PTE does not Granger Cause PLHE |    | 0.75198 | 0.4804 |
| PLHE does not Granger Cause PWE | 34 | 45.9580 | 1.E-09 |
| PWE does not Granger Cause PLHE |    | 2.04594 | 0.1475 |

**Source:** Extraction from Eview 10.0 Output

It was also discovered that there exist a bi-directional relationship among all employed variables.

## Results and Findings

Based on the formulated hypotheses earlier stated are statistically tested as shown in their null form. However, their results and findings are stated below:

### Hypothesis I

Treasury Bills do not significantly impact on public works expenditure in Nigeria. Employing table 3, the result reported in the said table indicate that there is a significant relationship between treasury bills (TB) and public works expenditure (PWE) in Nigeria. As reported in the table, TB has a coefficient of 45.31619 and a probability value of 0.0077, alluding to the presence of a positive and significant relationship between TB and PWE. Guided by the decision rule, the probability value of TB is less than 0.05, thus the rejection of the null hypothesis and acceptance of the alternative of a significant relationship between treasury bills and public work expenditure in Nigeria.

### Hypothesis 11

There is no significant relationship between treasury certificates and public works expenditure in Nigeria. Table 3 divulged the coefficient and probability value of treasury certificates as 14.22122 and 0.0526 respectively. Informed by the decision rule, we fail to reject the null hypothesis stating

that there is no significant relationship between treasury certificates and public works expenditure in Nigeria.

### **Hypothesis 111**

Development Stock does not significantly impact on public works expenditure in Nigeria. The result of the analysis presented in table 3 gives the coefficient of development stock and associated probability value as 13.02316 and 0.0269. Given that the probability value is less than 0.05, we reject the null hypothesis and accept the alternative that typifies that development stock does significant impact on public works expenditure in Nigeria.

### **Conclusion**

Based on the above findings, we can conclude that public works sector expenditure are greatly financed by government domestic debt Instruments which is captured by treasury bills, treasury certificates and development stock in Nigeria. The findings agree with the study of Williams, Okonkwo and Abolore (2014) found out that there is a linear relationship between domestic debt and public utility.

Thus, domestic debt funding elements is an important determinant for the demand of public works expenditure in Nigeria.

### **Recommendations**

As matter of policy implementation, from the empirical findings of this study, we recommend the following:

- i) Government should source for more funds with treasury certificates in other to have the needed suitable funds for infrastructural financing.
- ii) Domestic debt proved to be a veritable source in financing public works sector in Nigeria, as results from the analyses, substantial chunk of domestic borrowing should be deployed to this subsector to ensure adequate supervision as well as monitoring of maintenance public utilities.
- iii) The government should make known to the public the benefits of domestic borrowing as it leads to economic development.

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