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External Debt Burdens and Economic Growth: A Vector Error Correction Approach from Nigeria

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ABSTRACT: This study examined the effect of external debt burden on the growth of Nigeria economy. Time series data was sourced from Central Bank of Nigeria Statistical Bulletin from 1986-2019. Nigeria real gross domestic was proxied for dependent variable while debt servicing; external debt stock, debt overhang, debt sustainability and crowd-out effect of external debt were proxies for independent variables. The study employed multiple regression models to estimate the relationship that exists between external debt burden indicators and Nigeria economic growth. Ordinary Least Square (OLS), Augmented Dickey Fuller Test, Johansen Co-integration test, normalized co-integrating equations, parsimonious vector error correction model and pair-wise causality tests were used to conduct the investigations and analysis. The study findings revealed that 72 percent of the variations in Nigeria gross domestic products can be explained by the changes in external debt burden indicators. The results indicated a negative coefficient with external debt stock and debt overhang while a positive coefficient with debt sustainability, debt servicing and crowd out effect of external debt on Nigeria gross domestic products. From the findings, the study concludes that external debt burdens significantly affect growth of Nigeria economy. We recommend that the fund borrowed should be effectively managed, the federal government should laydown guidelines in terms of defining the purpose, duration, moratorium requirements and commitments, negotiation among others including conditions for external debt loans. Government should initiate and develop policies that will address the fundamental causes of external debt.

KEYWORDS: External Debt Burdens, Economic Growth, Vector Error Correction Approach, External Debt Servicing, External Debt Sustainability

INTRODUCTION

Nigerian like other countries faced financial challenges in her economic operations which resulted in borrowing the deficit proportions outside the countries financial boundary. This is term external borrowing and external debt which is a component of public receipt. It comprises borrowing from foreign lenders such as banking institutions, government and international financial institutions (Umaru, Hamidu and Musa, 2013). Nigerian external debt profile include trade areas, balance of payment, support loans, project tied loans and loans for Socio- economic needs (Umoru and Erunke, 2016). In structure, Nigerian external debt comprises Nigerian debt with the multilateral club, Paris club, London club, promissory notes and others (Taiwo, 2012). The Nigerian government has embarked on borrowing externally for the main purpose of financing increased proportion of economic activities for economic growth. It has been argued by Aminu, Ahmadu and Salihu (2013) that in Nigeria, external borrowing is often considered the best way out of embarrassing economic situations.

Nigeria external debt levels rose to a level constituting a debt crisis. The bulk of this debt is made up of public and publicly guaranteed debt. The main source of the supply of external debt was the emergence of the Eurodollar market resulting from the surplus revenue generated by the OPEC through significant increases in the price of oil between 1973 and 1979. Cheap petrodollars' were recycled to Nigeria. Unfortunately, Nigeria failed to use the external debt wisely and prudently. A number of interrelated factors contributed to the rise in external debt including macroeconomic policy, increases in the price of a number of primary commodities encouraging countries to borrow, low real interest rates and a favourable world environment (Orji, 2018).
External debt burden can be measured in terms of, debt service/export receipts; Debt stock/export receipts; and Debt stock/GDP. Service payment of a given year is the sum of the matured principal sum plus the accrued interest due. The World Bank recommends a debt-service ratio of not more than 10% for public debts, which take precedent over private debts. The precedent of the public debt owed to the Paris Club of creditors over private debt owed to the London Club is reiterated by the modus

operandi led down for debt negotiation. Debtor countries must first negotiate with the London Club of short-term creditors. Unless a rescheduling agreement was reached with the London Club the official Paris Club of medium/long-term creditors will not reschedule or negotiate with the debtor country. Ejigayehu (2013) noted that the effect or indicators of external debt in Nigeria is seen from the Gross Domestic product as a percentage of total debt, the ratio of interest payment to export, the ratio of external reserve total external debt, the ratio of debt servicing to total debt. The consequence to Nigerian economy is the huge amount spent in debt servicing, pressure in balance of payment and exchange rate.

The debt overhang hypothesis basically indicates that the accumulated debt acts as a tax on future output, discouraging productive investment plans of the private sector and adjustment efforts on the part of governments. Foreign debt acts like a tax when the debt situation is such that given any improvement in the economic performance of the indebted country, part of gains goes to higher debt repayments; that is, creditors receive part of the fruits of increased production or exports by the debtor country (Adesola, 2009). The above shows that there two school of thought on the effect of external debt on economic growth, this study wants to examine the real effect of external debt on Nigeria economic growth.

In Nigeria, studies on the effect of external debt have largely been devoted to describing the origin, causes and sustainability of the debt problem. Other group of studies focused on the effect of selected external debt indicators on the growth of Nigeria economy and does not focus on the sources and the compositions of the external debt. Some of these studies include: Raheem (1998; 1994), Ajayi (1991; 1995), Nyatepe – Cool (1993), Chibber and Pahwa (1994), Uwah (1995), and Iyoha (1997), Adedoyin, Babalola, Otekinri and Adeoti (2016); Adeniran, Azeez and Aremu (2016); Ajayi and Oke (2012); Aminu, Ahmadu and Salihu (2013). While all the above studies have looked into one aspect or the other of external debt, they failed to explain the effect of Nigeria source of external debt and the effect on the economic growth and therefore the studies are limited in scope, nature and analysis of external debt. Methodologically, most of them employ single equation framework which is inadequate in analyzing the long-term inter-temporal relationship between external debt and growth, thus making it difficult to capture the dynamic behaviour of the economy being modeled. From the above problems and knowledge gap, this study examined the effect of external debt burdens on the growth of Nigeria economy.

LITERATURE REVIEW

External Debt

External debt according to World Bank (2004) is defined as debt owed by the government to non-residents repayable in terms of foreign currency, food or service. It is a source of financing capital formation of an economy. Ayadi and Ayadi (2008) opined that the amount of capital available in most developing countries treasury is grossly inadequate to meet their economic growth needs mainly due to their low productivity, low savings and high consumption pattern. The reported financial inadequacies lead countries to source for supplementary financing.

Sulaiman and Azeez (2012) noted that external debt is one major source of aid to developing nations. But the rate at which they borrow depends on the links among foreign and domestic savings, investment and economic growth so that the borrowing countries can increase their capacity output with the aid of foreign savings (Ijirshar, Fefa and Godoo, 2016). It is required that the borrowing nation should be able to invest the borrowed fund wisely especially in financing development projects like railway construction, electricity generation plants, road construction and any other major capital project of the economy. However, Ijirshar et al (2016) pointed out that external debt can only be productive if well managed by making the rate of return higher than the cost of servicing the debt.

Debt Burden Indicators

The burden of a country's external debt may not be easily discernible until the total arrears of debts outstanding (principal + interest) are calculated and presented in ratio forms. To obtain a clearer picture of Nigeria's external debt burden the following conventional ratios have been computed from the relevant statistics of CBN's publications (Orji, 2018). The ratios are:

1. Debt service/export receipts;
2. Debt stock/export receipts; and
3. Debt stock/GDP

Ratio of Debt Service to Export- Receipts

It is the ratio of matured debt or debt-service payment due for a given year to the export earnings or receipts of the same year. Service payment of a given year is the sum of the matured principal sum plus the accrued interest due. The magnitude of the

export earnings of a given year determines how high or how low the debt-service ratio of a country will likely be, by a given debt service payment of the same year.

The repayment of the principal loan and the accrued interest is an important international obligation of a debtor country. It is, however, possible to defer the matured debt, if a moratorium or a rescheduling agreement is reached with the creditor country. Any debt not rescheduled on due date or after the period of grace is deemed to be in default. A default could have international repercussion (Amassoma, 2011). International confidence in the debtor country's ability to discharge her international obligations becomes eroded and the prospects of the debtor country securing future loans or credit lines become jeopardized.

The World Bank recommends a debt-service ratio of not more than 10% for public debts, which take precedent over private debts. The precedent of the public debt owed to the Paris Club of creditors over private debt owed to the London Club is reiterated by the modus operandi led down for debt negotiation (Amassoma, 2011). Debtor countries must first negotiate with the London Club of short-term creditors. Unless a rescheduling agreement was reached with the London Club the official Paris Club of medium/long-term creditors will not reschedule or negotiate with the debtor country.

Ratio of Debt Stock to Export

The ratio measures the outstanding debt stock of a given year as a percentage of the export receipts of the same year. It is important to note that debt stock of a given year is many folds greater than debt service payment of the same year (Amassoma, 2011). The ratios for the period 1983-2011, are significantly high and suggest that the outstanding debt stock of each year could 'swallow' the export proceeds of the same year several times. In order words if the export receipts for each year in the period, 1983-2005 were to be applied in full to retire the outstanding debt stock of the same year in question then the export will be grossly inadequate.

Debt Servicing

Krugman (1988) asserts that debt servicing obligations cause distortions in an economy and hence discourage investment and economic growth. Eaton (1993) argues that external debt is a complement to domestic savings and investment. Opponents of foreign debt contend that external debt depresses capital investment in two ways: through both an impediment consequence and a crowding out influence. Panth *et al*. (2006) claimed that public investment is crowded out by debt servicing, thereby adversely affecting productivity growth. This argument is supported by Fosu (2010), who contends that constraining debt servicing would shift public expenditure away from important social services such as healthcare and education. The government would be forced to increase internal borrowing in order to meet external debt servicing obligations. In the process government will hog borrowings on the domestic market thereby depriving private investors of the much needed funds for investment. Increased borrowing on the domestic market also has the effect of pushing interest rates up making the cost of borrowing for investment prohibitive. However, Ijirshar, Joseph & Godoo (2016) noted that external debt can only be productive if it is well managed by making the rate of return higher than the cost of servicing the debt.

Debt-Overhang

Debt-overhang occurs when a nation's debt is more than its debt repayment ability. Krugman (1982) explains debt overhang as one whereby the expected repayment amount of debt exceeds the actual amount at which it was contracted. Borensztein (1990) also defined debt overhang as one where the debtor nation benefits very little from the returns on additional investment due to huge debt service obligations. The debt overhang effect comes into play when accumulated debt stock discourages investors from investing in the private sector for fear of heavy tax placed on them by government. This is known as tax disincentive. The tax disincentive here implies that because of the high debt and as such huge debt service payments, it is assumed that any future income accrued to potential investors would be taxed heavily by government so as to reduce the amount of debt service and this scares off the investors thereby leading to disinvestment in the overall economy and as such a fall in the rate of growth (Ayadi and Ayadi, 2008). In addition, Clement *et al* (2003) stated that external debt accumulation can promote investment up to a certain point where debt overhang sets it and the willingness of investors to provide capital starts to deteriorate. Audu (2004) relates the concept of debt overhang to Nigeria's debt situation. He stated that the debt service burden has prevented rapid growth and development and has worsened the social issues. Nigeria's expected debt service is seen to be increasing function of her output and as such resources that are to be used for developing the economy are indirectly taxed away by foreign creditors in form of debt service payments (Ekperiware *et al*, 2005). This has further increased uncertainty in the Nigerian economy which discourages foreign investors and also reduces the level of private investment in the economy.

Cohen (1993) and Clement *et al* (2003) observe that aside from the effect of high debt stock on investment, external debt can also affect growth through accumulated debt service payments which are likely to "crowd out" investment (private or public) in the

economy. The crowding-out effect refers to a situation whereby a nation's revenue which is obtained from foreign exchange earnings is used to pay up debt service payments. This limits the resources available for use for the domestic economy as most of it is soaked up by external debt service burden which reduces the level of investment. Tayo (1993) opined that the impact of debt servicing of growth is damaging as a result of debt-induced liquidity constraints which reduces government expenditure in the economy. These liquidity constraints arise as a result of debt service requirements which shift the focus from developing the domestic economy to repayments of the debt. Public expenditure on social infrastructure is reduced substantially and this affects the level of public investment in the economy. Furthermore, some researchers have come up with other ways through which external debt may affect economic growth. According to (Borenstein, 1990) external debt affects growth through the credit rationing effect which is a condition faced by countries that are unable to contract new loans based on their previous inability to pay.

Debt sustainability

Debt Sustainability is defined as the ability to maintain a constant debt-GDP ratio over a period of time. Sustainability is challenged when the debt to GDP ratio reaches an excessive value. Kasidi and Said thought that, a number of factors come into play when establishing if a country is able to service its debt (Amassoma, 2011). These factors include the existing debt stock and associated debt service, the prospective path of its deficits, the financing mix of the debt and the evolution of its repayment capacity in terms of foreign currency value of gross domestic product, exports and government revenues.

Crowding-Out Effect

The weight of debt service on the government decreases public expenditure, including expenditure on social investments such as education and healthcare, which are vital for economic growth. Furthermore, weighty debt obligation suggests that the government short-term revenue must be used to service the debt, thereby crowding out public investment into the economy (Serieux & Yiagadeesen, 2001). Reduction in public investment can lead to a decrease in private investment, since some private investments and public investments are complementary (Diaz-Alejandro, 1981; Taylor, 1983). Dependence on external loan acquisition is not only thought wise on the grounds that extreme domestic borrowing results in financial precariousness and crowding out the private sector (Panizza, Sturzenegger & Zettelmeyer, 2010), but also, as contended by Todaro and Smith (2006), it is necessary for unindustrialized nations in their initial phases of development to borrow externally, since domestic savings at that stage could be insufficient for the achievement of the needed development.

Economic Growth

Economic growth refers to the increase in the amount of the goods and services produced by an economy over time. It is conventionally measured as the percent rate of increase in real gross domestic product, or real gross domestic product. Growth is usually calculated in real terms, i.e. inflation adjusted terms, in order to net out the effect of inflation on the price of the goods and services produced. In economics, "economic growth" or "economic growth theory" typically refers to growth of potential output, production at "full employment," which is caused by growth in aggregate demand or observed output Arthur Lewis (1963) in his concept of economic growth incorporates the human element and sees the goal of economic growth as "the growth of the output per head of population. Sichel and Eckstein (1974) defined economic growth as an increase in the ability of the economy to produce commodities service.

THEORETICAL REVIEW

The Dual Gap Theory

This theory was propounded by Chenery (1966) who postulates that economic growth depends on investment and that is a function of savings. Omoruyi (2005) stated most economies have experienced a shortfall in trying to bridge the gap between the level of savings and investment and have resorted to external borrowing in order to fill this gap. Ayadi and Ayadi (2008) argued that acquisition of external fund depends on the relationship between domestic savings, foreign funds, investment and economic growth. The dual gap theory is coined from a national income accounting identity which connotes that excess investment expenditure (investment- saving gap) is equivalent to the surplus of imports over export (foreign exchange gap).

Laurenceson (2002) developed a two-gap model for sustaining external debt. This model implies that inflows of foreign capital cause economic growth in developing countries. Thus, the assumption in the present model is that when the developing countries will receive the external debt, there will be observed an increase in investment greater than the domestic savings. By assuming that foreign exchange gap is binding, the increase in import is provided by a foreign capital inflow which implies economic growth.

Dual gap theory states that development is dependent on capital investment, which emanates from domestic savings that is insufficient in achieving the needed development of a nation. Based on this premise, the government of a developing nation seeks to acquire some form of external loans that are necessary to augment the existing domestic savings in order to be able to invest adequately in infrastructure and other developmental projects. In other words, capital projects financing is not a domestic affair, it requires external loans to be able to meet the required financial obligations for their construction, be it a dam, road and railway constructions, hospitals, schools, power stations among others.

Dependency Theory

The dependency theory seeks to outline the factors that have contributed to the development of the underdeveloped countries. This theory is based on the assumption that resources flow from a "periphery" of poor and underdeveloped states to a "core" of wealthy states thereby enriching the latter at the expense of the former. The phenomenon associated with the dependency theory is that poor states are impoverished while rich ones are enriched by the way poor states are integrated into the world system (Todaro, 2003; Amin, 1976).

Dependency theory states that the poverty of the countries in the periphery is not because they are not integrated or fully integrated into the world system as is often argued by free market economists, but because of how they are integrated into the system. From this standpoint a common school of thought is the bourgeoisie scholars. To them the state of underdevelopment and the constant dependence of less developed countries on developed countries are as a result of their domestic mishaps. They believe this issue can be explained by their lack of close integration, diffusion of capital, low level of technology, poor institutional framework, bad leadership, corruption, mismanagement (Momoh and Hundeyin, 1999). They see the under-development and dependency of the third world countries as being internally inflicted rather than externally afflicted.

Overhang Debt Theory

This theory was propounded by Krugman (1982) who explained that debt overhang as one whereby the expected repayment amount of debt exceeds the actual amount at which it was contracted. Myer (1977) presented debt overhang as excessive debt that inhibits investment, arising from the fact the benefits derived by the firm using high risky financing accrue largely to existing debt holders instead of shareholders. This theory is built on the principle that if the level of debt will surpass the country's ability to repay with some probability in the future, estimated debt service is expected to be a growing function of the country's output level. Therefore some of the returns obtained through investing in the domestic economy are efficiently taxed away by current foreign creditors and the investment made by domestic and new foreign investors is not encouraged.

Neo-Classical Growth

This was first propounded by Robert Solow over 40 years ago. The model believes that a sustained increase in capital investments increased the growth rate only temporarily, because the ratio of capital to labour goes up. The marginal product of additional units is assumed to decline and thus an economy eventually moves back to a long term growth-path with the real GDP growing at the same rate as the growth of the workforce plus factor to reflect improving productivity. Neo-classical economists who subscribe to the Solow model believes that to raise an economy long term trend rate of growth requires an increase in labour supply and also a higher level of productivity of labour and capital. Differences in the rate of technological change between countries are said to explain much of the variation in growth rates. The neo-classical models treat productivity improvements as an exogenous variable which means that productivity improvements are assumed to be independent of the amount of capital investment.

Empirical Review

Ajayi and Oke (2012) investigated the effect of the external debt burden on economic growth and development of Nigeria and their findings indicates that external debt burden had an adverse effect on the nation income and per capital income of the nation. High level of external debt led to devaluation of the nation currency, increase in retrenchment of workers, continuous industrial strike and poor educational system. This led to the economy of Nigeria getting depressed. Ali and Mustafa (2012) examined the long run and short run impact of external debt on economic growth of Pakistan for the period 1970-2010. The study reveals that external debt exerts a negative impact on Pakistan economic growth.

AL-Kharusi and Mbah (2018) employed autoregressive distributed lag co-integration approach and error correction mechanism to investigate the short-run effect of external debt on the economic growth. The study made use of time series data ranging from 1990 to 2015 and were collected from the World Bank and the Central Bank of Oman. The findings indicated a significant negative influence of external debt on the economic growth of Oman. The study further revealed that fixed capital had a significant positive impact on economic growth.

AL-Refai (2015) investigated the impact of debt on the economic growth of Jordan for 1990 to 2013. The study applied Cobb-Douglas production function and the ordinary least squares method to empirically establish the relationship between debt and economic growth. The findings indicated that external debt and labour impacted negatively on Jordan's economic growth while domestic debt and gross fixed capital formation had a significant positive effect on the economic growth of Jordan.

Al-Zeaud (2014) empirically assessed the impact of public debt on Jordan economic performance using time series data that covers the period 1991 to 2010. Per capita growth was the dependent variable while the independent variables are population growth rate, investment rate, terms of trade, inflation rate, ratio of fiscal balance to economic growth, ratio of public debt to GDP, and debt service payment in Jordan. Using ordinary least square technique, results estimated showed that public debt has a positive impact on economic growth while debt service has a negative impact on economic growth in the Jordanian economy. Babatunde, Sani and Sani (2016) used quarterly data from 2000 to 2014 to determine the optimum public debt threshold for Nigeria's economic growth. The study found a threshold level of 73.70 percent for public debt as a percentage of GDP, while the external and domestic debts were projected at 49.4 and 30.9 percent, respectively. The findings implied that if the accumulated debt exceeded the expected threshold levels, it would have an unfavourable influence on economic growth.

Choong, Lau, Liew, and Puah (2010) examined the effect of different types of debts on the economic growth in Malaysia during the period 1970 – 2006. Using co-integration test, their findings suggest that all components of debts have a negative effect on long run economic growth. The Granger causality test reveals the existence of a short-run causality linkage between all debt measures and economic growth. Put together, the outcomes of these studies suggest that the relationship between external debt and economic growth is mostly negative but still inconclusive.

Ekperiware and Oladeji (2012) examined the effect of external debt relief on economic growth in Nigeria using regression technique on quarterly time series of external debt, external debt service and real gross domestic product. Applying Chow- test to the regression result they found that there was a structural break in the relationship between economic growth and external debt in Nigeria during the period 1975 to 2005. The study concluded that the external debt relief made more resources available for economic growth in Nigeria and recommended a shift towards discretional concessional borrowing. It also identified external debt relief as a good option for poor unsustainable indebted countries as a way of making resources available for economic growth with the real sector being the focal point where value is created rather than impeding it with mismanagement and servicing debt.

Ezeabasili, Isu, and Mojekwu, (2011) investigated the relationship between Nigeria's external debt and economic growth between 1975 and 2006 applying econometric analyses. The result of the error correction estimates revealed that external-debt has negative relationship with economic growth in Nigeria. They stated that Nigeria must be concerned about the absorptive capacity noting that consideration about low debt to GDP, low debt service/GDP capacity ratios should guide future debt negotiations.

Ijirshar, Fefa and Godoo (2016) investigated the relationship between external debt and economic growth in Nigeria for the period of 1981-2014. They used both descriptive and econometric tools in empirically analyzing the time series data generated. The findings show a significant relationship between external debt and economic growth in Nigeria in a long run, while external debt servicing had both long run and short run negative effect on Nigeria economic growth. They recommend that external loan stock borrowed be effectively managed since it increases growth rate.

Imimole, Imoughele and Okhuese (2014) analyzed the determinants of external debt in Nigeria using time series data covering 1986 to 2010. Terms of trade, openness of the economy, budget deficit, gross domestic product, foreign direct investment, and exchange rate are some determinants of external debt evaluated in the study. Johansen cointegration test shows the existence of at least two co integrating relationship among the variables in the long run and the error correction model shows that exchange rate, gross domestic product, and external debt services are significant determinant of external debt in Nigeria.

Nwanne and Eze (2015) investigated the relationship between external public debt servicing and receipt and exchange rate fluctuations in Nigeria from 1981 to 2013. The findings of the study showed that external debt receipts and external debt servicing have positive short and long-run relationships with naira exchange rate fluctuations. The study concluded that whereas external public debt receipts affect exchange rate positively, external public debt servicing affects exchange rate negatively.

Udofia and Akpanah (2016) investigated the impact of external debt on economic growth in Nigeria. The issue was empirically examined using the cointegration test and the error correction test for Nigeria over the period 1980 to 2012. Findings from this study supported the traditional view between external debt and growth. Also, the study found the non-existence of debt overhang problem for Nigeria. It is recommended from the study that development activities in Nigeria be financed through increased export

earnings spearheaded by export led growth strategy as well as investment in human capital as these can be the best alternative to external debt in the long run.

Ugwu and Nzewi (2016) evaluated the effect of external debt on economic growth parameters in Nigeria. They employed ex post facto research design and the result show that positive relationship exists among external debt and economic growth parameter (GDP, exchange rate, capital expenditure). They conclude that small external debt accumulation stimulates the economy while huge debt s negative impact on the economy. Ugwuegbe, Okafor and Azino (2016) used annual time series data to investigate the effect of external borrowing and foreign aid on economic growth in Nigeria from 1980 to 2013. They used GDP as a parameter for economic growth and external debt, foreign aid, exchange rate regime and foreign reserve as the exogenous variables. Econometric techniques of Ordinary Least Square (OLS) multiple regression, Augmented Dickey Fuller (ADF), Johansen Co-integration, Error Correction Method (ECM) were applied. The results show that external debt has a positive and significant effect on economic growth, foreign aid has positive and insignificant effect on economic growth in Nigeria.

Uma,Eboh and Obidike (2013) examined of an empirical investigation of the influence of total domestic debt, total external debt cum servicing of external debt from 1970-2010 on the economic development of Nigeria show that total domestic and total external debts are inversely related to real gross domestic product, a proxy for economic development, but at an insignificant level, while Interest on total external debt relates positively.

Literature Gap

Adegbite, Ayadi and Ayadi (2008) examined impact that Nigeria's huge external debt stock had on its economic growth between 1975 and 2005. This study only focused on external debt indicators such as ratio of external debt to gross domestic products without considering other measures of external debt burden. This present study focused on broad measures of external debt burden indicators on Nigeria economic growth. AL-Kharusi and Mbah (2018) investigated the short-run effect of external debt on the economic growth. The study is foreign study whose findings cannot be applied in Nigeria. The present study focused on external debt burden and growth of Nigeria economy. Babatunde, Sani and Sani (2016) examined the optimum public debt threshold for Nigeria's economic growth. This study focused on external debt burdens and Nigeria economic growth.

METHODOLOGY

This study empirically investigates the relationship between external debt burdens and Nigeria economic growth. The relevant data were sourced from Central Bank of Nigerian Statistical Bulletin. Time series data were used and econometric method of data analyses which involves Ordinary Least Square (OLS) were employed. The multiple regressions formulated were based on external debt burden indicators.

RGDP = f(EXTDS, DOVH,DS, DST, CROE) (1)

Transforming equation 1 above to econometric method, we have:

$$RGDP = \alpha + \beta_1 EXTDS + \beta_2 DOVH + \beta_3 DS + \beta 4\, DST + \beta 4 CROE + \mu_i \quad (2)$$

Where:

RGDP = Real gross domestic products
EXTDS = External debt stock
DOVH = Debt overhang
DS = Debt Servicing
DST = Debt sustainability
CROE = Crowd out effect of external debt
μ = Error Term
$\beta_1 - \beta_5$ = Coefficient of Independent Variables to the Dependent Variable
β_0 = Regression Intercept

Estimation Techniques

i. Stationarity Test:

Time series data are assumed to be non-stationary and this implies that the result obtained from Ordinary Least Square (OLS) may be misleading (Suleyman, 2014). It is therefore necessary to test the stationarity of the variables using the Augmented Dickey Fuller 1979 to test both level and first difference. The ADF test constructs a parameter correction for higher order correlation by assuming the times series follows an auto regressive process. Mathematically expressed as

$$\Delta y_t = c + \beta_t + \alpha y_{t-1} + \sum_{t-i}^{k} \gamma_j \Delta y_{t-j} + \varepsilon_t \quad (3)$$

$$\Delta y_t = c + \alpha y_{t-1} + \sum_{t-i}^{k} \gamma_j \Delta y_{t-j} + \varepsilon_t \quad (4)$$

Equation 5 is used to test for the null hypotheses of non-stationarity of unit root against trend stationarity alternative in Y_t where y refers to the examined time series. Equation 6 tests the null hypotheses of a unit root against a mean stationarity alternative.

ii. Johansen Cointegration Test

The cointegration test established whether a long run equilibrium relationship exist among the variables. It is generally accepted that to establish a cointegration, the likelihood ratio must be greater than the Mackinnon critical values. The model can be stated as

$$\Delta X_t = \mu + \Psi_1 \Delta X_{t-1} + \Psi_2 \Delta X_{t2} + \ldots + \Psi_{p-1} \Delta X_t - p + 1 \quad (5)$$

Where μ is a constant term.

ΔX_t Represents the first cointegrating differences

iii. Granger Causality

To determine the direction of causality between the variables, the study employed the standard Granger causality test (Granger, 1969). The test is based on Vector Error Correction Model (VECM) which suggests that while the past can cause or predict the future cannot predict or cause the past. Thus, according to Granger (1969) X Granger cause Y if past value of X can be used to the past value of Y, the test is based on the following regression model.

$$RGDP = \alpha_{2t} + \sum_{j=1}^{k} \phi_{2j} EXTDS_{t-j} + \sum_{j=1}^{k} \beta_{2j} DOVH_{1-j} + \sum_{j=1}^{k} \lambda_{2j} DS_{t-j} + \sum_{j=1}^{k} \theta_{2j} DST_{t-j} + \sum_{j=1}^{k} \beta_{2j} CROE_{1-j} + \sum_{j=1}^{k} + \mu \quad (6)$$

$$EXTDS = \alpha_{2t} + \sum_{j=1}^{k} \phi_{2j} RGDP_{t-j} + \sum_{j=1}^{k} \beta_{2j} DOVH_{1-j} + \sum_{j=1}^{k} \lambda_{2j} DS_{t-j} + \sum_{j=1}^{k} \theta_{2j} DST_{t-j} + \sum_{j=1}^{k} \beta_{2j} CROE_{1-j} + \sum_{j=1}^{k} + \mu \quad (7)$$

$$DOVH = \alpha_{2t} + \sum_{j=1}^{k} \phi_{2j} EXTDS_{t-j} + \sum_{j=1}^{k} \beta_{2j} RGDP_{1-j} + \sum_{j=1}^{k} \lambda_{2j} DS_{t-j} + \sum_{j=1}^{k} \theta_{2j} DST_{t-j} + \sum_{j=1}^{k} \beta_{2j} CROE_{1-j} + \sum_{j=1}^{k} + \mu \quad (8)$$

$$DS = \alpha_{2t} + \sum_{j=1}^{k} \phi_{2j} EXTDS_{t-j} + \sum_{j=1}^{k} \beta_{2j} DOVH_{1-j} + \sum_{j=1}^{k} \lambda_{2j} RGDP_{t-j} + \sum_{j=1}^{k} \theta_{2j} DS_{t-j} + \sum_{j=1}^{k} \beta_{2j} CROE_{1-j} + \sum_{j=1}^{k} + \mu \quad (9)$$

$$DST = \alpha_{2t} + \sum_{j=1}^{k} \phi_{2j} EXTDS_{t-j} + \sum_{j=1}^{k} \beta_{2j} DOVH_{1-j} + \sum_{j=1}^{k} \lambda_{2j} DST_{t-j} + \sum_{j=1}^{k} \theta_{2j} RGDP_{t-j} + \sum_{j=1}^{k} \beta_{2j} CROE_{1-j} + \sum_{j=1}^{k} + \mu \quad (10)$$

$$CROE = \alpha_{2t} + \sum_{j=1}^{k} \phi_{2j} EXTDS_{t-j} + \sum_{j=1}^{k} \beta_{2j} DOVH_{1-j} + \sum_{j=1}^{k} \lambda_{2j} DS_{t-j} + \sum_{j=1}^{k} \theta_{2j} DS_{t-j} + \sum_{j=1}^{k} \beta_{2j} RGDP_{1-j} + \sum_{j=1}^{k} + \mu \quad (11)$$

Vector Error Correction Model

Co-integration is a prerequisite for the error correction mechanism. Since co-integration has been established, it is pertinent to proceed to the error correction model. The VECM is of this form

$$\Delta y_t = \alpha \beta y_{t-1} + \sum_{i=1}^{j=1} \Gamma_j \Delta y_{t-1} + \pi + \varsigma_t, t = 1, \ldots, T \quad (12)$$

Where Y_t is a vector of indigenous variables in the model, α is the parameter which measures the speed of adjustment through which the variables adjust to the long run values and the β is the vectors which estimates the long run cointegrating relationship among the variables in the model. π is the draft parameter and is the matrix of the parameters associated with the exogenous variables and the stochastic error term.

Table 1: Variables and A-priori Expectations

Variable	Measurement	Notation	Expected Relationship
Real Gross Domestic Products	% Increase or decrease in nominal GDP	RGDP	Dependent variable
External debt stock	% Increase or decrease in Nigeria external debt	EXTDS	+
Debt overhang	Debt service to export	DOVH	-
Debt Servicing	Debt Servicing to gross domestic products	DS	-
Debt sustainability	External debt servicing to Government revenue	DST	+
Crowd out effect of external debt	External debt to domestic real investment	CROE	-

Source: Authors Research Desk 2021

ANALYSIS AND DISCUSSION OF FINDINGS

Table 2: Presentation of Unit Root at Level

Variable	Test critical values	T-stat	ADF value	PROB.	Order of Integration
Unit Root at Level					
RGDP has a unit root			-3.030429	0.0424	1(0)
	1% level	-3.646342			
	5% level	-2.954021			
	10% level	-2.615817			
EXTDS has a unit root			-4.524695	0.0010	1(I)
	1% level	-3.646342			
	5% level	-2.954021			
	10% level	-2.615817			
DST has a unit root			-2.107665	0.2431	1(0)
	1% level	-3.653730			
	5% level	-2.957110			
	10% level	-2.617434			
DS has a unit root			-0.484090	0.8817	1(0)
	1% level	-3.653730			
	5% level	-2.957110			
	10% level	-2.617434			
DOVH has a unit root			-1.891631	0.3317	1(0)
	1% level	-3.661661			
	5% level	-2.960411			
	10% level	-2.619160			
CROE has a unit root			-5.492852	0.0001	1(0)
	1% level	-3.646342			

	5% level	-2.954021			
	10% level	-2.615817			
Unit Root at Level					
RGDP has a unit root	1% level	-3.689194	-5.417151	0.0000	1(I)
	5% level	-2.971853			
	10% level	-2.625121			
EXTDS has a unit root	1% level	-3.679322	-6.068328	0.0000	1(I)
	5% level	-2.967767			
	10% level	-2.622989			
DST has a unit root	1% level	-3.661661	-11.41373	0.0000	1(I)
	5% level	-2.960411			
	10% level	-2.619160			
DS has a unit root	1% level	-3.670170	-7.931302	0.0000	1(I)
	5% level	-2.963972			
	10% level	-2.621007			
DOVH has a unit root	1% level	-3.737853	-3.231548	0.0304	1(I)
	5% level	-2.991878			
	10% level	-2.635542			
CROE has a unit root	1% level	-3.699871	-6.469763	0.0000	1(I)
	5% level	-2.976263			
	10% level	-2.627420			

Source: Extracts from E-view 9.0, 2021

From Table 2, the results of the unit root tests show that the null hypotheses of a unit root for time-dependent variables of a non-stationary nature can be made stationary at the first difference. It also shows that all the variables are not stationary at level but stationary at first difference and are integrated of order 1(1). This implies that percentage of Nigeria real gross domestic products as our dependent variables and all our explanatory variables became stationary at first differencing and it is integrated of 1(1).

Table 3: Johansen Co-Integration Test Results: Maximum Eigen

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.827627	128.9038	95.75366	0.0000
At most 1 *	0.663969	72.64468	69.81889	0.0292
At most 2*	0.546331	57.74702	47.85613	0.0232
At most 3*	0.229893	32.45465	29.79707	0.0149
At most 4	0.100936	4.095421	15.49471	0.8957
At most 5	0.021349	0.690570	3.841466	0.4060

Source: Extracts from E-view 9.0, 2021

From Table 3 the results of the Johansen co-integration test show that we adopt the alternative hypotheses of at most 3 co-integrating equation at the 5% level of significance. This implies that, there is linear combination of the variables that are stationary in the long run and also confirms the existence of a long-run relationship between external debt variables formulated in the model and Nigeria real gross domestic products.

Table 4: Normalized cointegrating coefficients

RGDP	EXTDS	DST	DS	DOVH	CROE
1.000000	0.114917	-4.027282	-0.295088	7.224361	-6.465875
	(0.06277)	(1.91137)	(0.09338)	(2.18364)	(0.64390)

Source: Extracts from E-view 9.0, 2021

The normalized co-integration test established the direction of long-run relationship that exists among the variables. As presented in the table 4, external debt stock and debt overhang have positive long run effect on Nigeria gross domestic products while debt sustainability, external debt servicing crowd-out effect of external debt have negative long run effect on the dependent variable.

Table 5: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	0.342682	3.1815	3.2388	4.8024	4.9919	2.5128
1	1.210991	9.8680*	4.3981*	6.7969*	5.5863*	3.6617*
2	0.510995	8.1716	3.4395	4.8305	4.5962	1.5561

Source: Extracts from E-view 9.0, 2021

The optimality of the lag length for the VAR model is first determined using the lag length selection criteria. The criteria are sequential modified LR test statistic (LR), Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SIC) and Hannan-Quinn Information Criterion (HQ). Table 5 presents the lag length selection criteria performed at 5% significance level. A lag length of 1 is chosen for the VAR model for all the criteria.

Table 6: Parsimonious Error Correction Estimates

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.123458	0.515097	-0.239680	0.8154
D(RGDP(-1))	0.117341	0.175029	0.670410	0.5178
D(RGDP(-2))	0.311349	0.170478	1.826332	0.0978
D(RGDP(-3))	-0.853640	0.163556	-5.219263	0.0004
D(EXTDS(-1))	-0.014304	0.004928	-2.902573	0.0158
D(EXTDS(-2))	-0.012000	0.005629	-2.131672	0.0589
D(EXTDS(-3))	-0.005650	0.004340	-1.302029	0.2221
D(DST(-1))	1.008789	0.321753	3.135293	0.0106
D(DST(-2))	-1.221351	0.310164	-3.937763	0.0028
D(DST(-3))	-0.000417	0.180607	-0.002307	0.9982
D(DS(-1))	0.023296	0.015354	1.517226	0.1602
D(DS(-2))	0.089097	0.029934	2.976414	0.0139
D(DS(-3))	-0.126143	0.033059	-3.815743	0.0034
D(DOVH(-1))	-1.515815	0.375321	-4.038716	0.0024
D(DOVH(-2))	1.376636	0.318573	4.321263	0.0015
D(DOVH(-3))	-0.253920	0.197586	-1.285111	0.2277
D(CROE(-1))	0.320808	0.076904	4.171546	0.0019
D(CROE(-2))	0.154668	0.068540	2.256601	0.0476
D(CROE(-3))	0.140920	0.055918	2.520104	0.0304
ECM(-1)	-0.134480	0.201955	-0.665889	0.5205
R-squared	0.897510	Mean dependent var		-0.156000
Adjusted R-squared	0.702779	S.D. dependent var		3.642990
S.E. of regression	1.986083	Akaike info criterion		4.444927
Sum squared resid	39.44528	Schwarz criterion		5.379059
Log likelihood	-46.67391	Hannan-Quinn criter.		4.743764
F-statistic	4.608979	Durbin-Watson stat		1.529610
Prob(F-statistic)	0.008612			

Source: Extracts from E-view 9.0, 2021

Given that, a long–run equilibrium relationship has been established. Therefore, we estimate the error correction term using the vector error correction model to examine their speed and magnitude at which the long-run equilibrium corrects for disequilibrium. The VECM is employed to capture the short-run deviations of the parameters from the long-run equilibrium.

The parsimonious error correction result indicates a good fit with an F-ratio of 4.608979 with probability of 0.008612, an R^2 of 89.7 and an adjusted R^2 of 70.2 meaning that the model explains approximately 89.7 and 70.2 of the variations in Nigeria gross domestic products can be explained by variation in the independent variables, the D-Watson statistic of 1.529610 suggests absence of any autocorrelation. The probability coefficient shows that at various lag the variables are statistically significant and ECM (-1) probability value is not significant.

The error correction term of -0.134480 has the appropriate negative sign is not significant and shows that approximately 13.4 percent of the deviation from long run equilibrium in Nigeria real gross domestic products is corrected every year (since it is estimated annually).

Table 7: Pairwise Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.
EXTDS does not Granger Cause RGDP	32	0.05010	0.9512
RGDP does not Granger Cause EXTDS		1.17017	0.3256
DST does not Granger Cause RGDP	32	1.11097	0.3438
RGDP does not Granger Cause DST		1.69177	0.2031
DS does not Granger Cause RGDP	32	0.41618	0.6637
RGDP does not Granger Cause DS		0.22910	0.7968
DOVH does not Granger Cause RGDP	32	0.56074	0.5773
RGDP does not Granger Cause DOVH		2.07184	0.1455
CROE does not Granger Cause RGDP	32	0.18238	0.8343
RGDP does not Granger Cause CROE		0.97407	0.3904

Source: Extracts from E-view 9.0, 2020

Pair wise causality tests were run on the model with an optimal lag of 2. The results are presented in Table 7. The researcher's interest here is to establish the direction of causality between the dependent variables (Nigeria gross domestic products) and the independent variables of external debt. The results show that the F-statistic for the null hypotheses of the causality test running from is accepted, the results also show no causality running in any direction from the independent variables to the dependent variable and from the dependent variable to the independent variable.

Discussion of Findings

The estimated regression model proved that Nigeria external debt stock have negative but no significant relationship with Nigeria real gross domestic product. The estimated coefficient of the variable justifies that increase of the variable by 1 unit negatively affect Nigeria real gross domestic products by 0.001 percent. The negative effect of external debt stock on Nigeria gross domestic product contradict our a-priori expectation and the objective of external borrowing which is to finance growth leading projects. The negative effect of external debt stock on Nigeria real gross domestic products can be traced to poor accountability of the borrowed funds, poor management and poor macroeconomic policies. The negative effect of external debt stock is in line with dependency theory. Empirically, the negative effect of the variable contradict the findings of Zaman and Arslan (2014) that gross capital formation and external debt stock have significant positive effect on Pakistan GDP while gross domestic savings does not have significant impact on GDP of Pakistan, Uzun, Karakoy, Kabadayi and Emsen (2012) that external debt has significant positive effect on growth rate in long run and openness has statistically significant positive effect on economic growth of Transitory countries but confirm the finding of Uma,Eboh and Obidike (2013) that total domestic and total external debts are inversely related to real gross domestic product.

Nigeria external debt overhang have negative and significant relationship with Nigeria real gross domestic product. The estimated coefficient of the variable justifies that increase of the variable by 1 unit negatively affect Nigeria real gross domestic products by 1.51 percent. The negative effect of external debt external debt overhang on Nigeria gross domestic product confirm our a-priori expectation as debt external debt overhang was expected to have a negative effect on real gross domestic. Findings from this study supported the traditional view between external debt and growth. Also, the study found the non-existence of debt overhang problem for Nigeria. The positive effect of external debt external debt overhang on Nigeria real gross domestic products can be traced to policies directed toward effective management of external debt. The positive effect of external debt stock is in line with dependency theory. Empirically, the positive effect of the variable contradict the findings of Zaman and Arslan (2014) that gross capital formation and external debt stock have significant positive effect on Pakistan GDP while gross domestic savings does not

have significant impact on GDP of Pakistan, Uzun, Karakoy, Kabadayi and Emsen (2012) that external debt has significant positive effect on growth rate in long run and openness has statistically significant positive effect on economic growth of Transitory countries but confirm the finding of Uma, Eboh and Obidike (2013) that total domestic and total external debts are inversely related to real gross domestic product.

External debt servicing has positive and no significant relationship with Nigeria real gross domestic product. The estimated coefficient of the variable as presented in table 6 justifies that increase of the variable by 1 unit positively affect Nigeria real gross domestic products by 0.02 percent. The positive effect of external debt servicing on Nigeria gross domestic product contradict our a-priori expectation as external debt servicing has been considered to be capital flight from the domestic economy. Empirically, the positive effect of external debt servicing contradict the findings of Utomi (2014) who established a long run relationship among external debt, debt servicing, exchange rate and real gross domestic product. However, the negative findings contradict the findings of Ugwuegbe, Okafor and Azino (2016) that external debt has a positive and significant effect on economic growth and the findings Ugwu and Nzewi (2016) that small external debt accumulation stimulates the economy.

External debt sustainability has positive and significant relationship with Nigeria real gross domestic product. The estimated coefficient of the variable indicates that increase of the variable by 1 unit positively affect Nigeria real gross domestic products by 1.0 percent. The positive effect of external debt sustainability on Nigeria gross domestic product confirm our a-priori expectation as external debt sustainability was expected to have a positive effect on the dependent variable. Empirically, the positive effect of the variable contradict the findings of Utomi (2014) who established a long run relationship among external debt, debt servicing, exchange rate and real gross domestic product. However, the negative findings contradict the findings of Ugwuegbe, Okafor and Azino (2016) that external debt has a positive and significant effect on economic growth and the findings Ugwu and Nzewi (2016) that small external debt accumulation stimulates the economy.

Crowd out effect of external debt has positive and significant relationship with Nigeria real gross domestic product. The estimated coefficient of the variable indicates that increase of the variable by 1 unit positively affect Nigeria real gross domestic products by 0.3 percent. The positive effect of crowd out effect of external debt on Nigeria gross domestic product contradict our a-priori expectation as crowd out effect of external debt was expected to have a negative effect on the dependent variable, the positive effect of crowd out effect of external debt on Nigeria real gross domestic products. Empirically, the positive effect of the variable contradict the findings of Utomi (2014) who established a long run relationship among external debt, debt servicing, exchange rate and real gross domestic product.

CONCLUSION AND RECOMMENDATIONS

Conclusion

The study findings revealed that 70.2 percent of the variations in Nigeria gross domestic products can be explained by the changes in external debt burdens. From the findings, the study concludes that there is no significant relationship between external debt stock and the growth of Nigeria gross domestic products, that there is no significant relationship between external debt overhang and the growth of Nigeria gross domestic products, that there is significant relationship between external debt servicing and the growth of Nigeria gross domestic products, that there is significant relationship between external debt sustainability and the growth of Nigeria gross domestic products and that there is significant relationship between crowd-out effect of external debt and the growth of Nigeria gross domestic products.

Recommendations

From the findings, the study makes the following recommendations:

1. The study recommends that, the stock borrowed should be effectively managed. The federal government should laydown guidelines in terms of defining the purpose, duration, moratorium requirements and commitments, negotiation among others including conditions for external debt loans. This is to guide against high external debt stock that would lead to exceeding healthy threshold.
2. Government should initiate and develop policies that will address the fundamental causes of external debt. There should be political will from government to ensure proper use of borrowings to develop all sectors within the economy. Proper debt payment plan should be formulated and strictly adhered to. Government need to provide a model for public- private sector cooperation on develop human capital development to enhance development to strengthen the economy.
3. The study recommends adequate measures to be put in place to manage borrowed fund by ensuring that borrowed fund are expended on capital project that will generate income and there should be appropriate measures in place that will

serve as checks and balances on government spending such as institutional framework for analyzing and managing public investment projects.

4. Borrowed funds should be channeled to the purpose in which they have been borrowed this will help foster economic development. The government should work towards freeing up more expenditure for capital project, as this stimulates growth, encourage productivity as against the current focus on more recurrent spending, which only compounds our fate as a consuming nation, thereby affecting long run growth in the country
5. Debt Management Office should set mechanisms in motion to ensure that loans are utilized for the purpose for which they were acquired. This could be achieved through proper monitoring of the use to which the funds are put.

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