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FISCAL DEFICIT EXPANSION AND DEBT SERVICE COSTS: DEFAULT RISK AND AN ALTERNATIVE PARADIGM

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Abstract
The study examined the growth in fiscal deficit and the impact of increasing total debt service costs that might increase default risk; and the adoption of an alternative paradigm. The estimated model was tested by ARDL and ECM a well a Granger econometric methodologies. The nominal exchange rate, oil price, balance of payments, total debt servicing cost, and fiscal deficit were the regressors, while the fiscal deficit was chosen as the dependent variable. The results from the estimated model demonstrate that, except for the price of oil, all other variables point to a causal relationship between changes in the fiscal deficit value, which is a crucial step in Nigeria's journey toward increasing debt and the adopted regressors. The link between the budget deficit and the exchange rate and overall cost of debt payment is notably negative. The fiscal deficit and the overall cost of debt servicing as well as the balance of payments have a one-way causal link, according to the Granger causality test. It follows that a rising fiscal deficit will only make the debt problem worse. Therefore, a rising debt service cost raises the total debt service value. Debt accumulation raises the fiscal deficit, and the fiscal deficit increases lead to a spike in the overall cost of debt servicing, which fuels further debt accumulation and ultimately results in possible default as the country's revenue falls further. The country has to plug the loop holes in the generation of revenue through oil exports and increasing tax revenue. By demonstrating that the flow of causality is unidirectional and that increases in the budget deficit further fuel growth in debt payment costs, this study contributes to the body of knowledge already available in Nigeria on the subject. It shows that further borrowing by the Federal government can only lead to greater spikes in the budget deficit and a worsening depreciation of the naira as well asa continuous negative balance of payment situation. The alternative paradigm is the debt service cost in relation to actual revenue.

Key Words: Balance of payment, Debt servicing cost, Fiscal deficit, Nominal exchange rate.

Introduction
The literature concerning sovereign debt describes it amongst others as that debt that is issued by a particular sovereign government and currently countries all over the world are involved inlarge scale borrowing and lending on a global scale (Yue & Wei, 2018). Global dynamics due to the recent COVID 19 pandemic has increased the level of

borrowing due to fiscal expansion in order to stimulate the domestic economy in both developed and developing countries. Many countries were already deep in debt with a rising debt profile; the pandemic might also have accelerated the growth in their fiscal deficit and debt profile. The Nigerian experience is not different from the global situation; but that increasing debt profile preceded the pandemic. Ariemu (2023) noted that "data from the Debt Management Office, DMO, did show that Nigeria's debt servicing increased by 14.68 per cent to N3.36 trillion in 2022 as against N2.93 trillion spent in the previous year".

There seems to be a looming crisis; though it may be viewed as being yet distant as we see measures of debt sustainability such as the ratio of total debt to GDP being low. Debt to GDP ratio is defined as the ratio between total government/sovereign debts taken by a country to the total GDP of the country or the economic output for an entire year and a lower ratio of this number is always preferred as it means the economy is well balanced in terms of its total GDP when compared to debt and similarly a higher ratio may be alarming and may signal the economy may be heading for a default. A specific drawback is that an increase in this ratio may not be an indication of an adverse economic situation as regards default risks as exemplified by the Japanese economy. Saugweme and Odhiambo (2018) did observe that a significant amount of attention is being shifted towards the influence of sovereign debt and sovereign debt service costs on the rate of capital formation, mostly in middle-income countries and low-income , in the rapidly expanding body of literature on the obstacles to positive economic expansion.

Adopting the total debt to GDP ratio as the measure of debt sustainability might not answer the question of the possible imminence of default risk due to dwindling revenue, rising debt service cost in the country. According to Athanasopoulou et al. (2018), there is a wealth of research on the factors that influence sustainable debt levels; it demonstrates both a nation's capacity to repay its debts and their sustainability. The sovereign debtor's capacity to fulfil its obligations (debt) is referred to as sovereign debt sustainability (Guzman, 2018). Nigeria's debt might look sustainable when you compare it to GDP, but may be much less sustainable when we account for actual government revenues in relation to debt service costs.
The Medium-Term Expenditure Framework and Fiscal Strategy (MTEF/FSP) report, which was recently released by the Federal Ministry of Finance, Budget, and National Planning, details that Nigeria's debt service costs for the first quarter of 2020 amounted to N943.12 billion, while the federal government's retained revenue was estimated to be N950.56 billion. This is expected to be 99 percent during that time period. In contrast, it is stipulated in the Joint World Bank-IMF Debt Sustainability Framework for Low-Income Countries that the debt-to-income ratio cannot exceed 23 percent (Eyisanmi, 2020). Akhtar (2022) pointed out the fact that for lower middle income Asian Emerging and Developing Economies (EMDEs), the debt to tax revenue ratio was 400 percent during 2009-2019, though it further worsened to 498 percent in 2020; but the debt-to-GDP ratio was 2.2 percent from 2009 to 2020 and 5.3 percent in 2020(one describes a far more serious default risk exposure).

The current rising debt service cost and falling revenue might pose a potential default risk scenario. The unfolding scenarios as regards default risk based on the total debt service cost to actual revenue ratio is a cause for concern as a sustained recovery of oil price in the near term becomes more and more elusive and the continuously expanding fiscal deficit might cause more sovereign debt increase. It has been observed that the "aggregate external gross financing needs in 2022-26 for developing countries amount to USD2.4 trillion" (Albinet & Kessler, 2022). Analysing falling revenues; increasing debt service cost may lead to increasing the deficit and creates the potential for a default that becomes more likely. To examine the situation, the following questions are asked; (1) does the fall in total revenue increase the budget deficit? (2) has the increase in the cost of debt service any impact on the budget deficit or vice versa?

The consideration of increasing total debt service cost in the face of falling revenues might expose a critical point of analysis as regards the potential risks to Nigeria in terms of debt default risk. The ability of a nation to consistently fulfil its debt obligations depends on its debt sustainability, which is clearly defined in this study and not subject to ambiguity as adopting the ratio of total debt to GDP.

Literature Review

Sovereign Debt

Sovereign debt has been referred to as public debt, which is the total amount of money borrowed by governments from other countries and international financial institutions as well as from within their own borders (Makhlouf, 2014). Amadeo (2021) did posit that sovereign debt is the total of a government's annual deficits and, when viewed over time, shows how much more a government spends than it takes in. If there were never any persistent fiscal deficits; when revenue is realized less than expenditure on sovereign debt might not exist. Significant deficits and debt may also raise questions about the government's ability to pay off its debt, especially if they are paired with uncertainty about the rate of economic growth (Baldacci &Kumar, 2010).

Sovereign Default

The risk that the debtor won't pay interest or principal during the designated grace period is known as sovereign default (Tomz & Wright, 2013). It can also begin when the sovereign "tenders an exchange offer of new debt with less favourable terms than the original issue" or when the sovereign breaches the agreement, according to Beers and Chambers (2006) and Tomz & Wright (2013). When an extra ***consensus ad idem*** (meeting of minds in agreement) cannot be established; it leads to a sovereign default takes place.

Theoretical Review

Debt Overhang

Debt overhang refers to a situation where an entity whether a body corporate, government or even a family has become so indebted it cannot easily source for increased debt; even when such borrowing would have been able to give more than adequate returns. Seeing it as public debt in the context of fiscal policy; Džakula and

Karalić (2012) posited that rather than utilizing taxes to pay for these expenses, the government views this as a commitment to cover a portion of public spending. The inability to pay debt service cost is a precursor to actual debt overhang. Morakinyo (2019) saw it as a structural macroeconomic debt overhang and that this is a condition where additional credit creation measures are engaged in to address an underemployment or output gap; the build-up that leads to debt overhang.

The Dual Gap Analysis

According to the twin gap analysis, progress depends on investment, and that investment alone, which calls for savings within the country and is insufficient to guarantee that development occurs. The ability to receive funds from overseas must exist so that the saved amount can be invested in any nation. Additionally, foreign resources must be added to the domestic resources—for example, by importing more than exporting (Hassan & Mamman, 2013).

The Liquidity Constraint Hypothesis

In this theoretical postulation, developing nations have fewer options to pay off their external debt as a result of increased external debt servicing. This limits these countries' capacity to borrow more money from outside sources, which puts pressure on domestic borrowing and causes crowding out. Crowding out happens when government borrowing rises; a kind of expansionary fiscal policy and investment spending falls. (Hassan& Mamman, 2013). The premise of a realistic and low debt to GDP ratio might blind side experts from the more critical increasing debt service cost in relation to falling revenue. In fact, according to Umurhohwo (2019), at $81.27 billion (N24.947 trillion) in debt stock at the time of the preceding evaluation; Nigeria's debt servicing-to-revenue ratio increased from 67 percent to 70 percent. In other words, roughly N70 would probably go toward debt repayment for every N100 earned into the public coffers. Oti, Odigbo and Odey (2016) opined that the amount of Nigeria's foreign debt increases over time due to a number of factors; including the country's increased borrowing from international capital markets, multilateral institutions, increasing backlog of unpaid foreign trade arrears, defaulting on past-due loans, recapitalization of outstanding interest liabilities from bilateral sources, and Naira depreciation. In Ghana, Kwadwo(2020) noted that the country was facing high financing costs in both domestic and external markets, due to the fact that interest rates in the international financial market remains susceptible to actions of the US-Federal Reserve.

Measuring the possible occurrence of default and debt overhang cannot thus be done via the total debt to GDP ratio; hence an assessment via the debt service cost to revenue and the issue that justifies debt buildup. Examining the trend, you will see that it continues to rise despite increases in oil prices. Second, the debt-to-income ratio shows how likely revenue is to pay off debt. It is similarly trending upward, and it is estimated that revenue may run out of debt service in roughly five years. If this comes to fruition, we will have a serious problem because our ratings would be noted by foreign rating agencies. Thirdly, there are certain concerns regarding our debt stock's complete capture. This suggests that the debt-to-GDP ratio of roughly 18%+, which we now consider to be a healthy level, may not be accurate when compared to the estimated

average of almost 56% for nations with similar developmental levels to Nigeria. Should this be the case, and some obligations from local governments as well as other uncollateralized debts have been left out, our present debt-to-GDP ratio might be off, and we might be closer to the debt trap than we realize. Finally, our foreign exchange receivables during that period of time are a cause for concern. The implications for price in the future are anything but heart-warming, given that over 80% of our current foreign exchange receipts come from the oil industry and movements in the oil markets, particularly as it relates to the shift to renewable energy (Morakinyo, 2019).

Alaje (2020) observed that the country's revenue base is used to pay down loans rather than its gross domestic product, making the notion that debt-to-GDP is preferable unfounded; What is the revenue base, apart from the economic growth? Concluding that; the ratio of debt service to income indicates what percentage of overall revenue goes toward paying off debt. Coulibaly, Gandhi and Senbet (2019) noted that debt levels are only one aspect of evaluating debt burden; further stating that the burden of servicing debt is a crucial statistic and that the cost of servicing debt has increased dramatically in a number of African nations. According to Adeneran et al. (2018), Africa is aware of the harmful effects of previous debt crises. The 1990s debt crisis was particularly notable for severely limiting fiscal room and hindering economic growth. Some experts disagree, arguing that the low tax collection is a result of both ongoing shocks to the price of oil and commodities and deteriorating macroeconomic conditions. The ability of nations to pay down their mounting debt is threatened by declining tax collections (Adeneran et al., 2018; Atta-Mensah & Ibrahim, 2020). There is currently a heated discussion over the advantages and disadvantages of future government debt buildup to finance increased spending, as a result of the recent ten years of low rates of interest and weak global growth (World Bank, 2019; Kose et al., 2021). Since the global financial crisis, the dynamics of government debt in EMDEs have gotten worse (Huidrom, Kose, and Ohnsorge 2016; World Bank 2015; 2017). The current study looks into the connection between growing debt payment costs and Nigeria's continuously expanding budget deficit using the liquidity restriction hypothesis and the debt overhang theory.

Empirical Review

Ardagna, Caselli, and Lane (2006) examined the influence of government deficits and indebtedness on long-term interest rates using a panel of sixteen OECD nations spanning many decades. In basic static specifications, contemporaneous long-term interest rates rise by roughly 0.1 percent for every 1 percent increase in the actual deficit relation to GDP. The identical shock causes a aggregate increase of over 1.5 percent in a vector autoregression (VAR) after ten years. Debt has a non-linear impact on interest rates; an increase in debt only influences interest rates in nations with above-average debt levels. Global fiscal policy is also crucial since rising government borrowing throughout the OECD raises interest rates in each nation. However, even after accounting for global debt and deficits, home fiscal policy still has an impact on domestic interest rates.

A new dataset, which include the amount of debt held by the government, non-financial

corporations, and households in 18 OECD nations between 1980 and 2010, was used by Cecchetti. Mohanty, and Zampolli, ((2011). Their findings corroborate the theory that debt slows down growth after a certain point. The cut-off point for public debt is approximately 85 percent of GDP. The resultant consequence is that nations with large debt loads need to take prompt, decisive action to solve their fiscal issues. The longer-term lesson is that in order to create the fiscal cushion required handling unforeseen circumstances, governments should maintain debt levels much below those projected. Their analysis of additional debt kinds produces findings that are consistent with these. Corporate debt starts to hinder growth when it surpasses 90 percent of GDP. Additionally, they indicate a household debt threshold of about 85 percent of GDP, however the impact is assessed quite loosely.

Economic stability can be jeopardized by excessive private sector debt, as Drehmann and Juselius (2012) investigated. In this special feature, they examine the relationship between recessions and financial crises and suggest using the debt service ratio (DSR) as a gauge of the financial restrictions brought on by private sector debts. The results demonstrate a relationship between the DSR before economic downturns and the magnitude of the output losses that follow. Furthermore, the DSR offers a very precise early warning signal up to a year or two ahead of time regarding potential systemic financial crises. They did come to the conclusion that the DSR can be a helpful additional indication for the accumulation of vulnerabilities in the financial and real economies.

Oyedele., Emerah, and Ogege (2013). (2013) utilized cointegration and using data from 1980 to 2010, regression analysis was used to examine the relationship between debt servicing and external debt and the decline of poverty in Nigeria.. Specifically, three analyses were undertaken; first, the time series properties of the concerned variables were ascertained with the help of the Augmented Dickey-Fuller (ADF) unit root procedures. Second, the long-run relationship among poverty reduction, debt –Income ratio, debt-service degree of openness, growth of agricultural value added, per capital income, inflation rate and investment-income ratio was examined in the context of the Johansen and Juselius (1990) framework. Thirdly, a multiple regression analysis was employed to examine the impact of external debt and debt servicing on poverty reduction. The overall results indicate that both the external debt and debt servicing cause poverty in Nigeria. This finding suggests that government needs to mobilize domestic saving to replace external debt.

The research on the connection between public debt and economic growth was reviewed by Lici and Dika (2016). Their assessment of the empirical literature indicates that while several research have documented that the nexus linking output growth to debt is negatively signed, none of the studies can definitively demonstrate a causal relationship between debt and economic development. Economic theory generally suggests that debt and growth have a negative relationship over the long term, although fiscal stimulus may have a favourable effect in the near term. Although the results are not entirely definitive, empirical research offers some support for both and suggests that the negative relationship may become more significant after reaching a particular

threshold. Unobserved heterogeneity problems could be a key cause of such.

For the time period t, or 24 periods, Taher (2016)adopted nine independent variables and one dependent variable in a multivariate linear regression equation model. The test results are consistent with some studies in literature that proved a negative correlation between public debt and nation's economic growth above certain threshold although this threshold is not standard. Public debt for the GCC countries has different effects on per capita GDP growth varying from country to country due to the variation in a number of different factors. The main finding of this study shows that country government debt and macroeconomic determinants have varied impacts on per capita GDP growth for various countries based mainly on their government debt ratios.

Orjinta and Nwadialor (2017) looked at a 20-year time series (1996-2015) to determine how debt repayment affected economic growth. The government gazette and the CBN statistical bulletin were the sources of the data. *Expost facto* research design served as the foundation for the study, while unit root, co-integrations, and ordinary least square regression were used to analyze the data. The analysis's findings showed that there was a negligible long-term link between real gross domestic product (RGDP) and domestic debt (DDET), but a significant one between real gross domestic product (RGDP) and external debt (EDEBT) and debt service (DEBT). Second, the results of the regression analysis showed that Nigeria's economic growth is positively significantly impacted by both external debt and debt servicing. The connection between real gross domestic product and external debt services is inelastic. The aforementioned findings support the recommendation that debt be taken on exclusively for the purpose of generating economic capital, as this has a direct bearing on economic growth.

According to Thao (2018), the relationship between public debt and economic growth has been given careful thought, particularly during the recent European sovereign debt crisis and the Financial Crisis (Global). The impact of public debt on economic growth is examined in this paper for six ASEAN countries (Indonesia, Malaysia, Philippines, Singapore, Thailand, and Vietnam) between 1995 and 2015. The real effective exchange rate, gross fixed capital formation, and foreign direct investment (FDI) are some of the control variables that are included. Furthermore, it determines if higher levels of public debt have a negative impact on economic growth. Regression study using the General Method of Moments (GMM) estimation demonstrates that public debt has a significant and positive impact on real GDP as measured by per capita growth rate. Nevertheless, the empirical investigation conducted on ASEAN countries has not revealed any negative effects associated with increased levels of debt. This outcome runs counter to the prevalent discourse regarding the detrimental impacts of public debt and economic expansion. It demonstrates how the ASEAN countries' effective public investments in their current stage of development are financed by public debt, which has long-term boosted economic growth. In addition, two important elements influencing the growth of ASEAN economies are foreign direct investment and gross fixed capital formation.
Ndoricimpa (2020) examined the threshold effects of public debt on economic growth in Africa using the panel smooth transition regression technique created by Gonzalez

et al. (2017). The study's findings show that although low public debt is either growth neutral or growth boosting, excessive public debt consistently impedes growth. The findings also demonstrate that there isn't a single debt threshold that applies to all of Africa and that modelling decisions have an impact on the debt threshold level.
By applying the Autoregressive Distributed Lag model and Bounds Testing methodologies, Fagbola, Sokunbi, Aderemi, and Adebayo (2020) critically assessed the impact of external debts to economic growth in Nigeria from 1981 to 2018. The results show that debt servicing and economic in Nigeria has a direct relationship.

Wittry (2020) employed a unique data set on resource extraction firms to examine the empirical impact of debt overhang by providing ex ante indicators of investment prospects and significant differences in terms of a firm's commitments. According to the results, (a) the overhang problem may be significant and more widely applicable to a company's non-debt liabilities; and (b) overhang issues related to traditional debt can be circumvented by debt composition and contracting.

Koh et al.(2020) did investigate the effects of debt accumulation using a three-pronged approach: a collection of case studies illustrating how rapidly mounting debt caused crises; an event study tracking debt accumulation episodes in 100 developing and emerging market countries since 1970; and a series of econometric models analyzing the relationship between debt and the likelihood of financial crises. Four major conclusions are drawn from the study. To begin with, almost 500 incidents of debt accumulation have been reported since 1970. Roughly half of these incidents were linked to financial crises, which often resulted in adverse economic consequences when contrasted with non-crises. Following eight years, during crisis occurrences, investment was often 15–22 percent weaker and production per capita was typically 6–10 percent poorer. Third, the probability of a financial crisis was raised by a quicker rate of debt accumulation (public or private), a higher proportion of short-term external debt, a higher debt service cover, and a lower reserves cover. Fourth, governments experiencing financial crises often used a mix of insufficient fiscal, monetary, and financial sector policies in addition to having institutional and structural flaws.

Ajayi and Edewusi (2020) examined the impact of Nigeria's public debt on the nation's economic growth. Specifically, the study looked at the connection between government debt and economic growth in Nigeria, assessed how external debt affected that growth, and determined how domestic debt affected that growth. Secondary time series data spanning 37 years (1982-2018) were gathered for the study. The data gathered for the study was estimated using descriptive statistics, the vector error correction model, the Johansen co-integration test, and the unit root test. Results of the study indicate that while domestic debt was shown to have a favourable long- and short-term impact on Nigeria's economic growth, external debt was found to have a negative long- and short-term effect. Based on these findings, the study suggested that policymakers take the required steps to ensure proper management of domestic debts; that national debts be acquired with the intention of attracting investment to the country; and that the government, via the relevant oversight committees, make sure that the nation's debt is used to fund the provision of essential services and facilities needed for the growth of

the country's communities and societies.

The literature on total debt service cost and the fiscal deficit nexus; the potential for sovereign default has focussed on debt sustainability via the use of total debt/GDP ratio; yet the potential for an eminent default can be critically accessed via total debt service cost spikes and the impact on further fiscal deficit growth in the face of falling revenues. This study attempts to bring to the front burner the need to see the predictive power of the total debt service costs increases in the face of falling revenue on the potential for default; based on its influence on increasing the fiscal deficit and increased borrowing with a diminishing ability to borrow more and increased borrowing costs as well as insufficient revenue generation.

Methodology

The research is done after the event, and our paper's approximated technique consists of three steps: testing unit roots and cointegrating tests between variables come first. Second, the gross product function regressions using the ARDL technique were used to determine how the fiscal deficit will ultimately raise the total cost of debt servicing in Nigeria. In the third stage, we will use the Error Correction Model (Engle and Granger, 1987) to look at the short-term effects of the total cost of debt payment on the budget deficit. The population for this study comprises all the variables such as total debt service cost, fiscal deficit, nominal exchange rate, oil price, and balance of payments since all of the variables are eligible for selection, observation and study. As can be seen below, the mathematical model is nested on top of the functional relationship. We may observe the potential presence of a relationship between the different macroeconomic variables that have been accepted (as response/dependent variables) and the risks of default and debt sustainability (explanatory/independent variables) from the theoretical and empirical literature review.

The model revealed below, shows the mathematical model is nested on top of the functional relationship. We may observe the potential presence of a nexus connecting the different variables (as response/dependent variables) to the regressor variables (explanatory/independent variables) from the theoretical and empirical literature review. The following describes the functional relationship between the variables:

$$FDT = \beta 0 + \beta 1 TDS + \beta 2 EXT + \beta 3\ OP + \beta 4\ BOP + e \quad (1)$$

The functional equations are transformed into an econometric model as below:

$$FDT_t = \beta 0 + \sum^{m} \beta_1 TDS_{t-0} + \sum^{n} \beta_2 EXR_{t-i} + \sum^{o} \beta_3 OP_t + + \sum^{o} \beta_4 BOP_t + e_t \quad (2)$$

Where;
β_0 = constant,
β_1 to β_4 are the coefficients of the independent variables,
FDT is the Fiscal Deficit,
TDS is the Total Debt Service
EXR refers to the nominal exchange rate,
OP is the Oil price,
BOP is the Balance of Payment
e refers to the error term.

Total Debt Service: The annual payments due to payment of the principal and interest rates of sovereign debt owed by Nigeria. The fiscal deficit and exposure to default risk or debt overhang are negatively impacted by rising debt service costs since they enlarge the fiscal deficit.
Fiscal deficit: The fiscal deficit refers to difference between total budgeted expenditure and the realized revenue earned in a fiscal year. The increased deficit has led to increased borrowing; hence there is a potential link between fiscal deficits increased due to some macroeconomic factors. Typically, a deficit is financed either by borrowing from the country's central bank or by issuing bonds and treasury bills, among other financial instruments, on the capital markets.
Oil Price: The price of Brent crude oil on the global market is referred to as the crude oil price. Since oil is Nigeria's only source of income, changes in its price have a significant effect on the country's budget imbalance. Either a positive or bad outcome is possible.
Exchange Rate: The exchange rate is the price at which the naira is exchanged for other currencies. Accruable revenue for the nation is significantly impacted by the US dollar's exchange rate to the naira. The country's ability to pay down its existing debt may be closely related to its fiscal deficit.
Balance of Payment: The record of all foreign financial transactions conducted by a nation's citizens is called the balance of payments, or BOP. The current account, capital account, and financial account are the three primary categories that make up the BOP.

The balance of payments (BOP), also referred to as the balance of international payments, is a statement of all transactions between entities in one country and the rest of the world over a given time period, such as a quarter or a year. The ECM analysis is used in this study. Stationarity, cointegration, and VECM tests make up the analysis of ECM, a restricted version of VAR that Sims developed in 1980 as a substitute model from Autoregressive Distributed Lag (ARDL) models that focused on minimizing the theoretical approach to be able to explain economic phenomena as well (Widarjono, 2009). The Granger causality test is the one that was used. The augmented Dickey-Fuller test (Dickey & Fuller, 1984) will be used to enhance the Dickey and Fuller model. The unit root in a time series sample is tested using the augmented Dickey-Fuller Test (ADF). The study utilized the Augmented Dickey Fuller (ADF) test as a preliminary diagnostic test prior to model estimation in order to investigate the stochastic time series characteristics of monetary policy tools and instruments on Nigerian financial markets. This will enable us to avoid the problems of spurious results' that are associated with non- stationary time series data," Mukunzi, (2004). That includes the monthly data for the six-year period beginning in January 2009 and ending in December 2020.

The process of co-integrating non-stationary variable degrees into an equation so that the linear combination (the equation's residuals) is stationary is known as co-integration (Oyeniyi, 1998).The variables in question are said to be co-integrated when both the independent and dependent variables have a unit root (non-stationary), but their linear combination is stationary. If the variables are integrated in the same order, there will

also be co-integration (Engle and Granger, 1987). Johanssen's co-integration test was adopted with two different test statistics namely Trace test statistics and the Maximum Eigen- value test statistics. Decision rule: Accept H_0: (there is no significant cointegration relationship) if t-statistic is greater than the asymptotic critical value or if the p-value is less than the level of significance, otherwise accept H_1 :(there is significant cointegration relationship) if test statistic is less than the asymptotic critical values or if the p-value is greater than the level of significance.

The models that will be tested are:

$$FDT=a+b_1TDS +b_2EXR +b_3OP + b_4 BOP +e \quad (2)$$

T-test- (significance test)

$H_0 : b_{1-4}= 0$

$H_1 : b_{1-4}< 0$

Decision rule, (1) if the calculated t is higher than the table value, reject the null hypothesis and accept the alternative hypothesis (2) where the p-value is less than the chosen significance level(5 percent) reject the null hypothesis and accept the alternative hypothesis.

F-test: The overall significance of each independent variable in explaining the dependent variable is measured by the F-statistics. For all the variables to be considered significant, the F-statistics value needs to be lower than 50 percent.

Goodness of fit test (R^2): This reveals how much of the endogenous (dependent variable) is explained by all the independent variables.

Result and Discussion

This section presented and analyzed estimated results on measures of sovereign debt accumulation and default risk in Nigeria. The section begins with descriptive statistics, after which the variables' stationarity was assessed using the ADF unit root test bound test and an Autoregressive Distributed Lag (ARDL) model.

Descriptive Statistics

Table 1 gives an overview of the variables under study. It summarizes key statistics such as mean, median, maximum, minimum, standard deviation and normality tests. Each variable has forty-one (41) observations with none missing. The Jarque-Bera probability values is also indicated at the 5% significant level.

Table 1: Descriptive statistics

	FDT	TDS	EXR	OP	BOP
Mean	-923.1877	2.68E+09	108.1675	11.51401	5.02E+09
Median	-117.2371	2.05E+09	111.9433	11.14464	1.10E+09
Maximum	32.04940	8.81E+09	399.9636	28.70544	3.65E+10
Minimum	-7118.708	4.95E+08	0.610025	1.573876	-1.60E+10
Std. Dev.	1734.778	2.01E+09	109.9115	6.173340	1.21E+10
Skewness	-2.304480	1.558474	0.972937	0.477526	0.935350
Kurtosis	7.466158	4.925675	3.172454	2.875631	3.849669
Jarque-Bera	70.36467	22.93196	6.519282	1.584635	7.211651
Probability	0.000000	0.000010	0.138402	0.452794	0.127165
Sum	-37850.69	1.10E+11	4434.867	472.0742	2.06E+11
Sum Sq. Dev.	1.20E+08	1.62E+20	483221.4	1524.405	5.86E+21

Observations	41	41	41	41	

The summary statistics for the independent and dependent variables under study are shown in Table 1. The table displays our variables of interest's mean, median, and standard deviation along with the skewness and kurtosis assessments. The mean values of FDT, TDS, EXR, OP and BOP are given as -923.1877, 2680000000, 108.1675, 11.51401 and 5020000000respectively while their respective standard deviations are 1734.778, 2010000000, 109.9115, 6.173340 and 12100000000. The results of the Jarque-Bera test for normalcy demonstrate that the exchange rate, oil price, and balance of payments have a normally distributed error term in the study model that was used. This is evidenced by their respective insignificant Jague-Bera probability value at 5% level. While fiscal deficit and total debt service are not normally distributed. All the variables are positively skewed except fiscal deficit.

Unit Root Analysis

To choose the appropriate model to utilize, a unit root test must be performed. For example, the variables integrated of order one, zero, or a combination of both can be subjected to ARDL. However, if variables are integrated of I (2) or greater, it may be ineffective. Therefore, the Augmented Dickey Fuller (ADF) unit root test was used to determine that none of the variables are integrated of higher order. Table 2 presents and discusses the ADF unit root test results as follows:

Table 2: Augmented Dickey-Fuller (ADF) Test for Unit Root

Variables	***Augmented Dickey-Fuller Test***				**Order of int.**	**Remark**
	@ level	**@ 1st Diff**	**5% C. V**	**Lag**		
FDT	-5.078196	-	-3.526609	Max	I (0)	Stationary
TDS	-2.936996	-6.674551	-3.526609	Max	I (1)	Stationary
EXR	0.068481	-4.776618	-3.526609	Max	I (1)	Stationary
OP	-2.292043	-7.613013	-3.526609	Max	I (1)	Stationary
BOP	-1.566611	-6.550883	-3.526609	Max	I (1)	Stationary

Source: Author's own computation using E view 10

In the unit root test in Table 2 above, it was determined that the total debt service (TDS), exchange rate (EXR), oil price (OP), and balance of payments (BOP) were all stationary at first difference; however, it was discovered that the fiscal deficit (FDT) was constant and stationary. Consequently, initial difference and level stationary time series data were used in this study. The Autoregressive Distributed Lag (ARDL) model's application is justified by this.

ARDL Bound Test for Long Run Equilibrium

The prerequisite for utilizing the ARDL has been met. So, the cointegration bounds tests and the F-statistic calculation will be employed to determine if the variables have a long-term relationship or not. ARDL combines the short- and long-term run dynamics without compromising long-term knowledge.

Table 3. F-Bound Test for the Model

F Bound Test Null Hypothesis No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	6.474199	10%	2.2	3.09
K	4	5%	2.56	3.49

	2.5%	2.88	3.87
	1%	3.29	4.37

Source: Author's own computation using E view 10

The computed Wald test (F-statistics) results are shown in Table 3. At the 5% significant level, the calculated F-statistics of 6.474199 are greater than the upper bound critical values of 4.49. For the anticipated ARDL models, a long-term cointegration relationship is therefore discovered. This supports the null hypothesis, which states that cointegration does not exist.

ARDL Estimates of the Long Run Regression

The results of the ARDL estimates of the long run relationship in the model are presented in Table 4 below.

Table 4. ARDL Long Run Regression Estimates for the Model

Levels Equation Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
TDS	-7.21E-07	2.81E-07	-2.565515	0.0180
EXR	-13.98268	5.631744	-2.482834	0.0216
OP	30.96789	28.76878	1.076441	0.2939
BOP	5.46E-08	2.67E-08	2.048557	0.0532
C	1441.149	712.6207	2.022322	0.0561
EC = FDT - (-0.0000*TDS -13.9827*EXR + 30.9679*OP + 0.0000*BOP +1441.1487)				

Source: *Author's own computation using E view 10*

Table 4 displayed the long run regression estimates' outcome. The regression estimates show that the balance of payments, which is duly signed, has a favorable impact on both the price of oil and Nigeria's budget deficit. Accordingly, an increase of one unit in the price of oil and the balance of payments will result in a predicted increase of 30.96789 and 5.46E-08 units in Nigeria's budget deficit. According to the ARDL error correction model result shown in Table 4, Nigeria's default risk, as expressed in terms of fiscal deficit, is negatively impacted by the current total debt service (TDS) value. The result shows that this is the case because the TDS coefficient has a negative value of -7.21E-07. This implies that if total debt service increases by 1 unit, it would result to about -7.21E-07 units' decrease in fiscal deficit in Nigeria holding other factors constant. For the overall debt service. This implies that Nigeria's budget deficit will be lessened over time if the oil price and balance of payments both improve. Nevertheless, there is an improper signature on the exchange rate and the total amount of debt serviced. This means that with a one unit increase in the dollar to naira exchange rate and total debt servicing, Nigeria's budget deficit will drop by -7.21E-07 and -13.98268 units. At the 5 percent (0.05) level, the probability value of 0.0180 indicated that it is statistically significant.

Likewise, Table 4 revealed that the current value of exchange rate (EXR) has a negative impact on fiscal deficit with a coefficient of -13.98268 units. The negative value of exchange rate indicated that a one unit increase in exchange rate would result to about -13.98268 units decrease in the fiscal deficit, holding every other variable constant. The exchange rate was statistically significant at 5 percent, as indicated by the associated probability value of 0.0216, because the probability value is less than 0.05. On the contrary, the current value of oil price (OIL) has a positive effect on fiscal deficit in Nigeria with a coefficient of 30.96789. This implies that if the oil price (OP) increases by 1 unit, this would lead to increase in fiscal deficit of 30.96789 units all things being equal. This result is in agreement with expected result and as

well with some empirical results. The oil price's probability value of 0.2939 suggests that it is not statistically significant at the five percent (0.05) level.

Lastly, with a coefficient of 5.46E-08, the current balance of payments had a long-term positive influence on the budget deficit, implying that if the current value of balance of payment increase by one unit it would lead to an increase in fiscal deficit by 5.46E-08 unit all things been equal. The probability value of 0.0532 indicates statistical significance at 5% level.

ARDL-ECM Regression Result

Since there was a long-run cointegration relationship between the variables based on the model's ARDL Bound test results, the ARDL-ECM test was done to account for the short run. The outcomes are shown in Table 5.

Table 5 ARDL Error Correction Regression

ARDL Error Correction Regression
Dependent Variable: D(FDT)
Selected Model: ARDL(4, 4, 0, 0, 3)
Case 2: Restricted Constant and No Trend
Date: 06/27/23 Time: 14:43
Sample: 1981 2021
Included observations: 37

ECM Regression
Case 2: Unrestricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FDT(-1))	0.119360	0.115273	1.035461	0.3122
D(FDT(-2))	-0.133234	0.120525	-1.105448	0.2815
D(FDT(-3))	0.516512	0.126931	4.069237	0.0006
D(TDS)	-5.52E-09	2.05E-08	-0.269026	0.7905
D(TDS(-1))	9.35E-08	2.96E-08	3.158748	0.0047
D(TDS(-2))	7.06E-08	2.30E-08	3.075268	0.0057
D(TDS(-3))	5.06E-08	2.16E-08	2.344183	0.0290
D(BOP)	1.68E-08	4.72E-09	3.572486	0.0018
D(BOP(-1))	-4.18E-09	5.27E-09	-0.792753	0.4368
D(BOP(-2))	2.93E-08	5.47E-09	5.352571	0.0000
CointEq(-1)*	-0.280857	0.040499	-6.934987	0.0000
R-squared	0.881148	Mean dependent var		-192.3256
Adjusted R-squared	0.835436	S.D. dependent var		423.4727
S.E. of regression	171.7879	Akaike info criterion		13.37217
Sum squared resid	767288.4	Schwarz criterion		13.85109
Log likelihood	-236.3852	Hannan-Quinn criter.		13.54101
Durbin-Watson stat	2.144575			

* The p-value does not match the distribution of t-Bounds.
Source: Author's own computation using E view 10

The error correction factor (ECM) integrates the short run dynamics with that of the long run dynamics. The error correction term ECM_{t-1} indicates the speed of adjustment from a short run deviation to the long run equilibrium. The coefficient of ECM_{t-1} is negative (-0.280857) and is moderate, supporting the ARDL bounds test result of cointegration. It indicated that about 28 per cent of the previous year's deviation from the long run equilibrium will be restored within a year. Furthermore, the result revealed that the Durbin-Watson (DW) statistic of 2.144575

indicated that there is no serial correlation.

According to Pesaran, Shin, and Smith (2001), a graphic investigation of the stability of the estimated coefficient of the error correction model is also necessary. Furthermore, the Cumulative Sum (CUSUM) of the Recursive Residual is established graphically. The cumulative sum and cumulative sum of squares plots (CUSUMSQ and CUSUM, respectively) are shown in Figure 1.

Diagnostic Test

Some of the posttest are conducted to ascertain the validity and stability of the stated model. Some of these tests are: normality test for normal distribution of the variables, the Ramsey Reset test verifies the stability of the given model, the LM test determines serial correlation, and the constant variance of the error term is found using the heteroscedasticity test. The results are shown in Table 6 that follows:

Table 6: Model Diagnostic Test Results

Diagnostic Tests for the Model	Obs*R-Square	Prob.	Decision
Normality Test (JarqueBera)	0.855349	0.6520	Reject
Heteroskedasticity (Glejser Test)	12.44355	0.6452	Reject
Ramsey Resset Test	1.176901	0.2909	Reject
Breusch-Godfrey LM Test	1.067514	0.5864	Reject

Source: Author's own computation using E view 10

The various Obs*R-Square and F-Statistic results in Table 6 revealed that the Error term is normally distributed with a zero mean, there is Homoscedasticity (implying that the variance of the error term are constant irrespective of the period). The absence of serial dependency in the error term indicates the non presence of serial correlation and the accuracy of the model's specification.

Stability Tests

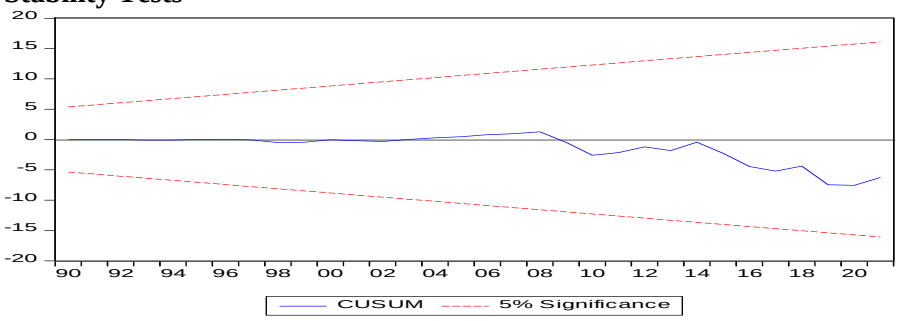

Figure 1: Cumulative Sum for the Model

The CUSUM-Squared graph expressed in Figure 1 revealed that the cumulative sum of squares plot falls between the upper and lower 5 percent significance criteria, it may be concluded that the calculated ARDL model's residuals are stable.

Results of Granger Causality Tests

The R2, t-test, and F-test are crucial tests to do in causality relationships since they are crucial in determining the decision rule pertaining to the direction of causation. Ordinary least squares (OLS) residuals, the basis for all diagnostic tests, have been found to be heteroscedastic and correlated even in cases when the genuine errors have common variance and lack correlation. Table 7 displays the findings of the Granger causality tests.

Table 7: Granger Causality Test Result

Movement of causality among the variables	Obs	F-Statistic	Prob.	Decision
FDT does not Granger Cause TDS	39	5.89809	0.0063	Reject
FDT does not Granger Cause BOP	39	4.03591	0.0267	Reject
EXR does not Granger Cause TDS	39	3.37104	0.0462	Reject
EXR does not Granger Cause OP	39	4.52092	0.0182	Reject
BOP does not Granger Cause EXR	39	4.42854	0.0195	Reject

Table 6 shows that the fiscal deficit (FDT) Granger causes the balance of payment (BOP), the nominal exchange rate (EXR) Granger causes the total debt service (TDS), the nominal exchange rate Granger causes the movement of the oil price, and the balance of payment Granger causes the movement of the nominal exchange rate in Nigeria. It is a one-way relationship. The null hypotheses are rejected. The result reveal that growth in foreign direct investment flows will enhance the performance of the Nigerian financial sector. Opening the economy through trade would attract foreign direct investment. Stable nominal exchange policy would improve gross capital formation. Finally, good performance of the commercial banks would attract portfolio investment flows. See appendix for detail result.

Test of hypotheses

Hypothesis One

H_o: There is no significant link between oil price and the fiscal deficit in Nigeria.

According to Table 4, the current oil price's probability value of 0.2939 indicates that it is not statistically significant at the 5 percent level. The study's null hypothesis is thus accepted, and its alternative hypothesis is rejected. The study's conclusion is that, during the study period, there was no discernible relationship between the price of oil and Nigeria's budget deficit. The budget deficit is positively impacted by oil prices, although this effect is not statistically significant at 5 percent.

Hypothesis Two

H_o: The increase in debt service cost has no significant nexus with the fiscal deficit in Nigeria.

Table 4, indicated that the probability value of 0.0180 for current value of debt service cost showed that it is statistically significant at 5 percent level. As a result, the study's alternative hypothesis is accepted and hypothesis two is rejected. The study thus concludes that current value of debt service cost has significant impact on fiscal deficit in Nigeria. Furthermore, it also has negative impact on fiscal deficit in Nigeria. This is in contrast to Adamu and Rasiah's (2016) findings, Daniel and Ibrahim's (2021) research revealed no discernible relationship between Nigeria's external debt and fiscal deficit. External debt growth increases the deficit; which further increases debt accumulation, in additional to falling revenue generation might cause sovereign default.

Hypothesis Three

H_o: The Nigerian fiscal deficit is not significantly impacted by the Exchange rate.

From Table 4, the current exchange rate's probability value of 0.0216 indicates that it is statistically significant at the 5% level. As a result, the study's alternative hypothesis is supported and hypothesis three is rejected. Thus, the study comes to the conclusion that Nigeria's fiscal deficit is significantly impacted by currency rates**.**

Hypothesis 4:

H_o: The Nigerian budget deficit is not significantly impacted by the balance of payments.

According to Table 4, the current balance of payment value's probability value of 0.0532 indicates that it is statistically significant at the 5% level. Consequently, main hypothesis four is rejected and the study's alternative hypothesis is upheld. Thus, the study comes to the conclusion that Nigeria's budget deficit is significantly impacted by the balance of payments.

Conclusion and Recommendations

The findings from the estimated model shows that apart from oil price all other variables indicate a causal link between movements in the value of fiscal deficit; a key component the move towards growing indebtedness for Nigeria. The fiscal deficit is substantially inversely correlated with the exchange rate and the overall cost of debt repayment. The Granger causality test results indicate that there is a unidirectional causal relationship between the total cost of debt servicing and the balance of payments. It suggests that when the budget deficit increases, the problem of the deficit will also worsen. The value of total debt service therefore rises with a growing budget deficit. When debt levels rise, so does the fiscal deficit, which in turn raises the cost of servicing all outstanding debts. This could ultimately result in a default as the nation's revenue continues to decline.

There is a serious gap in the raising of revenue through tax, increased tax revenue will reduce the propensity to resort to debt accumulation. The problem oil theft if tackled can also mitigate the problem excessive borrowing. Further studies on how to improve the foregoing scenarios is recommended.

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