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IMPACT OF DEBT SERVICE ON FOREIGN DIRECT INVESTMENT IN NIGERIA

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Abstract

Foreign direct investment is crucial for the economic development of developing nation due to its contributions as source of external inflows into a host country, which are often determined by the debt level of a country. However, excessive debt can lead to debt servicing burdens, potentially crowding out investments in essential public services, as well as increase the risk of debt distress, making investors cautious about investing in the country. Therefore, the main objective of this study is to investigate the impact of debt service on foreign direct investment in Nigeria from 1984 to 2022. The data used for the study were sourced from the Central Bank of Nigeria Annual Statistical Bulletin. The Auto-Regressive Distributed Lag model was used to analyze the data. The findings revealed that long run relationship exists between debt service and foreign direct investment in Nigeria. Specifically, the study revealed that total debt service has positive and significant impact on foreign direct investment; while total debt has negative and significant impact on foreign direct investment. Based on the findings, the study recommends that borrowing should be minimized and other sources of revenue generation should be exploited by the Nigerian government in order to increase the country's revenue base thereby mitigating the effect of debt on investment.

Keywords: Central Bank of Nigeria, Debt Service, Exchange Rate, Foreign Direct Investment, Total debt.

1. Introduction

Nigeria has always encouraged foreign direct investment (FDI) in its attempt to promote or accelerate economic growth and development. This is based on the perception that domestic resource gap can be partly filled through FDI. FDI makes available foreign exchange which all things being equal should increase the country's capacity to import, and are considered as sources of external finance in developing countries (Ayenew, 2022). Such investment is perceived to enrich the host economy with streams of benefits among which are foreign exchange, foreign capital, technology as well as enhancement of a country's access to foreign markets. According to Oche *et al.* (2016), FDI is vital for economic development precisely for developing countries which are known for inadequate capital resources to meet the investment needs of the economy. Hence, FDI not only provides the above benefits but also crowds-in investment. FDI is considered as the most important source of private

external inflows for developing countries because by increasing investment in development project, more employment opportunities would be generated as well as skill management and expertise. The Nigeria economy has been having inadequacy of funds, frequent fiscal deficit, low exports, and balance of payment deficits due to rising cost of imports, which have led to wide gap between savings to investment (Onyele & Nwokoacha, 2016). These economic disruptions have resulted to the country resorting to deficit financing by the Nigerian government, thereby borrowing to augment the shortfalls in order to bridge savings-investment gaps and to finance the desired domestic investment. Public debt which is one of the main macro-economic indicators depicts the picture of a country in the international making; as it is a major determinant of FDI inflow. Increasing debt could discourage foreign investors' vision and create negative expectations of the future economy which

together reduces investment inflows into a country. Ogunjimi (2019) believed that incurring reasonable public debt will most likely enhance economic growth through investment. Conversely accumulation of debt by a country will over the time weaken the performances of a country's fiscal budget because large part of the budget would be channeled into debt serving.

A focus on the country's revenue shows that debt serving is becoming a huge problem for Nigeria. Debt servicing is the regular payment of installments of loans taken by a country from both domestic & external sources (Chinaemerem & Ozurumba, 2013). The debt burden of a country inevitably imposes a number of constraints on its investment and growth prospects. The burden of principal and interest payment for instance drains a nation's resources and curtails the possible expenditure of resources on other productive ventures. This is even more constraining considering those the resources from which the debts are to be serviced are very limited (Adegboyega, 2021). Large fund allocated for serving debt stifles domestic investment because little resources will be left for investment in the country thereby not achieving the preferred investment purposes and its related benefits. In Nigeria, debt serving has jeopardizes the country's investment. Despite its negative implications on investment, the country still

borrowes and service loans because government needs and operations must be undertaken (Olusegun *et al.* 2021)

It is worth mentioning that successive governments in Nigeria have spent enormous amount of funds to service her debt. According to the Central Bank of Nigeria Statistical Bulletins (2022), the total debt service payment was N1.61 billion in 1985, and rose astronomically to N23.82 billion after 5 years (1990). The figure stood at N51.06, N131.05 billion and N393.96 billion in the year 1995, 2000 and 2005 respectively. In 2010, debt service payment was N415.66 billion and increased to N1.060 trillion in 2015. By the year 2020, debt service stood at N3.26 trillion and further increased to N4.22 and N5.63 in 2021 and 2022 respectively. Despite the colossal amount spent on servicing debt by the Nigerian government, therefore, there is the need to ascertain its impact on foreign direct investment. It is against this backdrop that the study seeks to investigate the relationship between debt service and foreign direct investment in Nigeria. The following formulated hypotheses guide the paper:

H₀₁: Total debt service has no significant impact on foreign direct investment index in Nigeria.

H₀₂: Total debt has no significant impact on foreign direct investment index in Nigeria

2. Literature Review

2.1 Conceptual Issues

Concept of Total Debt Service

Total debt service according to Chinamerem and Ozurumba (2019) is the regular payment of installment of loans taken by a country from domestic and external sources; and such installment includes interest on debt and a part of the principal. They further noted that for a country to service her debt, that country should have timely cash flows. That if a country is unable to meet or honor its debt service obligation in the absence of required funds, the country is said to be unable to service her debt. Also, Chinamerem and Anayochukwu (2013) explained total debt service as the regular payment of installment of loans taken by a country

from domestic and external sources; and such installment includes interest on debt and a part of the principal. Debt service ratio is the ratio of its debt service payments to its export earnings (revenue). A country's international finances are healthier when this ratio is low, and it indicates better capacity of a country to repay its debt. Similarly, a high debt service ratio makes difficult for a country to stand by its debt obligations as it requires a higher portion of its export earnings. Debt service is used as an independent variable.

Concept of Total Debt

The Debt Management Office (2022) defined total debt as legal obligation of a country to pay back principal and interest to the holders of the predetermined rights in accordance with a certain schedule. These debts are often classified as public debt which according to Ogunjimi (2019) refers to total debt a country owes to foreign and domestic creditors or lenders. The debtors could be the government, corporations, deposit money banks, development banks or citizens of a country. These debts often arise whenever a country's projected revenue is inadequate to meet the projected expenditure which gives rise to budget deficit, and the deficit is often financed through borrowing with its attendant cost and associated terms and conditions relating to payment patterns at maturity. According to Essien, *et al.* (2016),

Concept of Foreign Direct Investment

Foreign direct investment (FDI) is investment directly into production in a country by a company located in another country, either by buying a company in the target country or by expanding operations of an existing business in that country (Abayomi, 2014). As part of a national account, FDI involves net inflows of investment to acquire a lasting management interest (10% or more of voting stock) in an enterprise operating in an economy other than that of the investors. FDI involves participation in management, joint ventures, transfer of technology and expertise.

Concept of Foreign Direct Investment Index

Foreign Direct Investment (FDI) index is the measures of change in foreign direct investment. It is an indicator of foreign direct investment that is used for the study.

Concept of Exchange Rate

Exchange rate is the price at which the domestic currency is exchanged for foreign currencies. It is the rate at which one currency will be exchanged for another; that is, the value of a country's currency in terms of another. Exchange rates can influence both the total amount of foreign direct investment that takes place and the allocation of this investment spending across a range of countries (Tan *et al.*, 2021). It is an important price and the dominant determinants of FDI

borrowing made by countries is as a result of inability of their government to raise enough revenue from local sources for the administration of government businesses. Public debt comprises external debt whose components are: multilateral debt, bilateral debt and commercial debt; while domestic debt components comprise federal government bond, treasury bills, federal government saving bond, federal government sukuk, federal government green bond, and the promissory notes. Based on Lidiema (2018) assertion, government domestic debt is used for various reasons including: financing the budget when the government is not able to meet its expenditure commitments using domestic raised revenue and external sourced grants and borrowing, helping in the implementation of monetary policy through open market operations.

FDI could be divided into inward FDI, which results to a net FDI inflows whether positive or negative, and outward FDI which involves stock of FDI (Abayomi, 2014). Based on Fontoura (2007) definition, FDI is an investment made directly into a country by investors of foreign nationals in a business entity located in another, and such investment is perceived to enrich the host economy with streams of benefits among which are foreign exchange, foreign capital, technology as well as enhancement of a country's access to foreign markets. Foreign Direct Investment is used in this study as a dependent variable.

inflows in an open economy. The depreciation of the host country currency and the appreciation of the foreign currency will reduce the relative production cost to foreign investors in the host country. Therefore, foreign investors only need to pay less money to purchase factors of production in this host country. This allows the foreign investors to expand the scale of investment in the host country, thereby promoting the inflow of FDI into the host country. This variable is expected to exert a positive impact on foreign direct investment in Nigeria.

2.2 Empirical Review

Emmanuel and Idebi (2023) examined the effects of public debt on foreign investment performances in

Nigeria for the period 2000 to 2021, using the autoregressive distributed lag technique of data analysis. The variables used in the study includes, domestic public debt, external public debt, debt service and foreign direct investment. The finding revealed that foreign direct investment responded negatively to domestic debt and domestic debt servicing, but responded positively to external public debt. Consequently, the study recommended that government should review its domestic debt policy regularly, as well as adopt policies that promote more foreign debt. Also, the government was advised to invest funds on income generation ventures in order to reduce the burden of servicing on the limited resources in Nigeria. The study's finding was specific to Nigeria economic context thereby limiting the generalization of the results to other countries or region.

Triatmanto *et al.* (2023) investigated the contributions and influence of total debt, foreign direct investment and human capital index on economic growth of Indonesia, Thailand, Vietnam and the Philippines using the panel vector auto-regressive model (PVAR) to analyze the data from 2000 to 2020. The variables used for the study were gross domestic product, total foreign debt, foreign debt, foreign direct investment and human capital index, proxy by education and health variables. The study found that gross domestic product has a positive significant relationship with foreign direct investment, but negative relationship with debt service. Furthermore, the gross domestic product and human capital index have negative relationship with GDP. Further findings also revealed positive relationship between FDI and GDP among the countries of interest. The study recommended that governments of the ASEAN member countries should jointly determine foreign investment policies and manage their foreign debt to increase economic growth. In addition, governments of the ASEAN member countries should pay more attention to their fiscal policies because increasing debt servicing can reduce economic growth. The study did not adequately test for robustness of its findings. Also, it overemphasized on foreign direct investment over other variables leading to unbalanced policy approach.

Shiyalini and Suresh (2022) examined the impact of public debt on foreign direct investment in developing market, using Sri Lanka as a case study from 1980 to 2020. The autoregressive distributed lag model was used to analyze the data. The variables used in the study are domestic debt, external debt, interest rate and exchange rate as independent variables while foreign direct investment was used as dependent variable. The study found that domestic debt accumulates foreign direct investment inflows in the long run, but foreign debt has a negative relationship with foreign direct investment inflows in the short run. Also, the study revealed that increase in lending rate decreases inflows of foreign direct investment in Sri Lanka. Furthermore, the depreciation of exchange rate decreases flow of foreign direct investment in the short run but encourages foreign direct investment in the long run. The study recommended that government of Sri Lanka should formulate policies that will ensure state debts are used efficiently for what they are borrowed for. However, the study lacks theoretical basis on which it is anchored. Also, it used simple linear regression model thereby oversimplifies the complex relationship between public debt and foreign direct investment. Also, the study's timeframe might not be representative of the current economic realities or policy changes in Sri Lanka.

Okonkwo *et al.* (2021) investigated the effect of exchange rate on foreign direct investment in Nigeria from 1981 to 2018, using secondary data obtained from the Central Bank of Nigeria and the federal office of statistics. Foreign direct investment was used in the study as the dependent variables, while nominal exchange rate and real exchange rate were used as the independent variables. The cointegration and error correction model was used for the data analysis. The findings revealed that both nominal exchange rate and real exchange rate are positively related to foreign direct investment. Hence, the study recommended that the central bank of Nigeria should ensure adequate inflow of foreign exchange in the foreign exchange market and also ensure sustainable/stable foreign exchange level in order to attract inflows of foreign

direct investment. The study also failed to include a theoretical framework that underpinned the study and also overemphasized on exchange rate stability over other variables. It also did not adequately test for robustness of its findings.

Tanet *al.* (2021) explored the influencing effect of exchange rate on foreign direct investment in the Zhejiang province of China from 1985 to 2019. The study employed the cointegration and vector error correction model for the analysis. The study used foreign direct investment as the dependent variables while exchange rate, cost effect index, wealth effect index and the demand effect index. The findings revealed that there exists a long run stable and unidirectional causal relationship between exchange rate and foreign direct investment inflow. Furthermore, in the short run, neither the exchange rate nor the three-influencing mechanism (the cost effect index, wealth effect index and the demand effect index) have significant impact on foreign direct investment inflow. The result recommended that for Zhejiang province to improve foreign direct investment human capital needs to be accumulated and infrastructure be improved. The timeframe of the study might not represent the current economic realities of Zhejiang. Also, the findings might be specific to Zhejiang 's unique economic and political context, limiting their applicability to other regions in China.

Ogunjimi (2019) examined the impact of public debts on investment in Nigeria from 1981 to 2016 using the Autoregressive Distributed Lag (ARDL) technique of analysis. The study used the variables private investment; public investment, foreign direct investment and public debt in the study. The result revealed that domestic debt improved both private and public investment in the short-run and long-run. In order words, domestic debt crowded-in both private and public investment, but does not attract foreign direct investment (FDI). The study further revealed that external debt crowded in private investment both in the short-run and the long run, crowded-out public investment, but does not influence FDI. The study recommends that policy makers formulate and

implement appropriate policies to ensure public debts are put to optimal use to stimulate investment. The study also recommends that external debt should be more favored over domestic debt because of its impact on investments. Ogunjimi used the right technique of data analysis. However, the study is not up to date, and also failed to provide a theoretical basis on which the study is underpinned.

Mugambi and Murunga (2017) investigate the effect of external debt service on foreign direct investment inflows in Kenya using time series data running from 1980 to 2014. The variables include the gross fixed capital formation, inflation rate, exchange rate and real GDP as the control variables. The findings showed that external debt service have a negative impact on country's foreign direct investments. Based on the findings, the study recommends that the government should not rely heavily on external borrowing to finance economic activities but should rather cut her programs to avoid higher budget deficit. The study fails to adopt a specific technique to analyze its data. Also, no theory was adopted as framework for the study. The study oversimplifies the complex relationship between external debt and FDI by using the simple linear regression model for its analysis. The time period is outdated, and might not reflect the current economic conditions of Kenya.

Eregha (2017) investigated the effect of exchange rate policies and inflationary expectation on foreign direct investment flow to the West African Monetary Zone (WAMZ). The Study employed the Arellano Panel Correction for Serial Correlation and Heteroscedasticity option of the Within Estimator for five of the WAMZ countries selected based on data availability for the period 1980-2014. Results showed that exchange rate uncertainty hampered FDI flow while inflation expectation had an insignificant effect on FDI flow to WAMZ. The fixed exchange rate policy regime was found to hamper FDI flow in the zone while intermediate policy regime had a significantly positive effect in facilitating FDI flow with periods of current account imbalances and changes in foreign exchange reserves as the channels since most of these countries

use their reserves from the restricted export earnings to intervene in the foreign exchange market to maintain the official rate. The magnitude and significance of the negative effect of fixed policy regime on FDI increased indicating that fixed regime is not a good policy in period of current account imbalance and depleting foreign exchange reserve. It is therefore recommended that monetary authorities in these countries especially in periods of depleting foreign reserve and current account imbalances allow the market to determine the exchange rate or reduce their intervention so as to eliminate unnecessary uncertainties that hinders FDI flow to the zone. However, the scope is not current.

Oche *et al.* (2016) evaluated the effect of public debt on foreign direct investment (FDI) in South Africa from 1983 to 2013 using the vector error correction model to show the relationship among the variables. Foreign direct investment was used as the dependent variable while public debt, exchange rate and interest rate were used as the independent variables. The vector error correction model was used to estimate the variables. The long run results show that the relationship between public debt and FDI as well as interest rate and foreign direct investment is positive and statistically significant, while exchange rate and foreign direct investment have a negative and insignificant relationship between them. The study therefore recommended that government should increase the level of public debt and interest rate so that the level of foreign direct investment in South Africa can also increase. Furthermore, the government of South Africa was advised not to

depreciate the currency in order to achieve high level of foreign direct investment. However, the scope of the study is not updated, and it failed to anchor the study with a theoretical basis.

Senibi *et al.* (2015) examined the response of domestic investment and foreign direct investment to shocks from public debt in Nigeria from 1981 to 2015, using the structural vector autoregressive framework (SVAR) estimation technique. The study used public debt as the dependent variable while domestic investment, foreign direct investment, lending interest rate, inflation and exchange rate were used as the explanatory variables. The study found that high foreign debt simultaneously increases internal debt since part of the domestic debt goes into servicing of external debt obligation, interest rate and capital payment. Hence, as public debt rise, credits to the private sector are crowded out and domestic investment subsequently decline overtime. Also, foreign direct investment failed to respond to shocks from public debt because high indebted profile countries tend to reduce foreign direct investment inflows. Additionally, domestic investment will continue to fall as exchange rate depreciates due to increase in demand for imported goods by Nigerian. The study therefore recommended that Nigeria's policies should be made to encourage the inflow of foreign direct investment in order to create employment opportunities which will provide revenue and consequently reduction in deficit financing. The scope is not up to date

2.3 Theoretical Framework

Dual –Gap Theory

The dual-gap theory was propounded by Harrod (1939) and Domar (1946). They identified the pre-conditions for the economic growth of market economies. The theory states that the development of less developed countries is constraint by two gaps: saving and investment required to take-off known as the “savings gap”, and export revenues and the import needed for development known as the “trade gap” (Balago, 2014). According to the theory, domestic savings is not sufficient to finance investment for economic

development. To fill the gap external sources of capital for investment are sought to complement the deficit. Hence, 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. The dual-gap analysis provides a framework that shows that the development of any nation is a function of investment and that such investment requires domestic savings which is not sufficient to ensure that development take

place. The dual-gap theory connotes that excess investment expenditure (investment-saving gap) is equivalent to the surplus of import over export (foreign exchange gap). The major assumption of the dual-gap model is that most developing countries either face a shortage of domestic savings to augment for investment opportunities or they are faced with foreign exchange constraints to finance the needed capital and

3. Methodology

This study employed the expost-facto research design because it describes the statistical association between two or more variables using time series data. Secondary data sourced from the Central Bank of Nigeria (CBN) Annual Statistical Bulletin 2022, and the debt management office Annual Report 2022 were used for the analysis for the period of 38 years spanning from 1984 to 2022. The data sourced from these sources were on foreign direct investment (FDI), total debt service (TDS), total debt (TDB) and exchange rate (EXCR). Descriptive statistic was conducted to have a

intermediate goods. To close the saving gap requires foreign direct investment (FDI) while to close the trade gap requires foreign aid. The dual-gap theory was coined from the national income accounting identity which connotes that excess investment expenditure (investment-saving gap) is equivalent to the surplus of import over export (foreign exchange gap).

glimpse of the raw data. Afterwards, a correlation analysis was done to determine the strength and direction of the linear relationship among the variables. Unit root tests were also conducted to determine the stationarity levels of the variables. This is to ensure that the estimated regression results are not spurious. Furthermore, a cointegration test was conducted to ascertain the existence of long run relationship among the variables. Consequently, the auto-regressive distributed lag model was employed to analyze the data. In testing the hypotheses of the study, the Wald test was employed.

3.1. Model Specification

Following the study of Oche *et al.* (2016), their model is adapted as follows:

$$LNFDI = \beta_0 + \beta_1 LNPDEBT + \beta_2 LNEXCHR + \beta_3 LNINT + e \text{ ----- (1)}$$

Where:

LNFDI = log of foreign direct investment

$$FDI = \beta_0 + \beta_1 TDS + \beta_2 TDB + \beta_3 EXR + \mu \text{ ----- (2)}$$

Where:

FDI = Foreign Direct Investment Index (This will be used to measure foreign direct investment)

TDS = Total debt service.

TDB = Total debt

LNPDEBT = log of public debt

LNEXCHR = log of exchange rate

LNINT = log of interest rate

This study modified the model of Oche *et al.* (2016) by including debt service in the model and expunging interest rate, thereby using one control variable instead of two. Consequently, the model for this study is hereby specified:

EXCR = Exchange rate

β_0 = Intercept

β_1 - β_3 = parameters to be estimated

μ = Error term

The Auto-regressive distributed model is specified as follow:

$$\Delta FDI_t = \beta_0 + \sum_{i=1}^p \beta_1 \Delta FDI_{t-i} + \sum_{t=1}^q \beta_2 \Delta TDS_{t-1} + \sum_{t=1}^q \beta_3 \Delta TDB_{t-1} + \sum_{t=1}^q \beta_4 \Delta EXR_{t-1} + \phi \lambda_{t-1} + \varepsilon_t - \text{--- (3)}$$

4. Results and Discussion

The results that are discussed in study include: descriptive statistics, correlation analysis, unit root

tests, bound test cointegration analysis and the regression analysis.

4.1 Descriptive Statistics

Descriptive statistics is carried out in order to have more idea of the data in its raw state.

Table 1: Descriptive Statistics

	FDI	TDS	TDB	EXR
Mean	2502.710	734.2541	7256.966	125.3190
Median	1190.620	213.7300	3818.470	120.5800
Maximum	8841.060	5656.580	40912.61	448.0000
Minimum	-186.7900	1.240000	40.48000	0.770000
Std. Dev.	2646.279	1256.137	10006.53	121.2808
Skewness	1.061858	2.431412	1.938460	1.015556
Kurtosis	2.923917	8.625182	6.046511	3.309501
Jarque-Bera	7.338435	89.84581	39.50657	6.859466
Probability	0.025496	0.000000	0.000000	0.032396
Sum	97605.69	28635.91	283021.7	4887.440
Sum Sq.Dev.	2.66E+08	59959463	3.80E+09	558943.1
Observations	39	39	39	39

Source: Output from Eview 10 (2024)

Table 1 described the statistics of the variables. The output showed that TDS has the highest average value of 7256.966 while exchange rate has the lowest mean value of 125.3190. The median which is the middle number when arranged from the smallest to the highest revealed that TDB has the largest middle number of 3818.470 while EXR has the lowest median of 120.5800. Out of the four variables, TDB has the maximum value while FDI has the minimum value of -186.7900. The standard deviation which measures the dispersion around the mean revealed that total debt is more volatile than the remaining variables, with standard deviation value of 10006.53. The skewness

which measures the asymmetries of the distribution revealed that all the variables were skewed to the right side of the distribution (positive skewness). The kurtosis revealed that TDS, TDB and EXR with kurtosis values of 8.625182, 6.046511 and 3.309501 were peaked (leptokurtic) relative to the normal distribution while FDI with value of 2.923917 was flat (platykurtic) relative to the normal distribution. The Jarque-Bera values of the variables revealed that all the variables are not normally distributed due to their probability values being less than 5%. The total observation for the study is 39.

4.2 Correlation Analysis

Correlation analysis describes the strength and direction of a linear relationship between two or more variables. It is a measure of the degree to which two or more variables vary together. That is, two variables are said to be correlated if they tend to simultaneously vary to the same direction. The parameter used in this study to measure the correlation is the correlation coefficient (r), which shows the degree of linear relationship between

two variables. Correlation can take on only values from +1 to -1, and the closer the absolute value of r is to 1, the stronger the correlation between the variables. The sign (+ or -) indicates whether there is a positive or negative correlation. According to Cohen (1988), correlation coefficient between 0.10 to 0.29 denotes weak correlation, 0.30 to 0.49 denotes moderate correlation, and 0.50 to 1.0 denotes strong correlation. Table 2 showed the outputs of the correlation matrix.

Table 2: Correlation Output

Probability	FDI	TDS	TDB	EXR
FDI	1.000000			
TDS	0.015700 (0.9244)	1.000000 -----		
TDB	0.053891 (0.7445)	0.987408 (0.0000)	1.000000 -----	
EXR	0.285635 (0.0780)	0.910926 (0.0000)	0.951758 (0.0000)	1.000000 -----

Source: Output from Eview 10 (2024)

Table 2 is the correlation output of the variables. The relationship between FDI and TDS indicates positive correlation. However, the strength or degree of the relationship is weak and insignificant with correlation value of 0.015700 (1.57%) and probability value of 0.9244. Also, the correlation between FDI and TDB is

4.3 Unit Root

Estimating a model with non-stationary data makes the result to be spurious, hence the need to conduct a unit root test. For stationarity to exist, the value of the absolute value of the Augmented Dicker Fuller test

weak and insignificant based on its value of 0.053891 and the corresponding probability value of 0.7445. Furthermore, the relationship between FDI and EXR with correlation value of 0.285635 indicates that the relationship is also weak and insignificant.

statistics should be greater than the critical value at 5% (as adopted in this study), and the probability value is should be less than 5% level of significant. The summary of unit root outputs is shown at Table 3.

Table 3: Summary of Unit Root Test Results

Variables	ADF Results	Critical Value @ 5%	Prob. Value	Integration
FDI	-8.291491	-2.945842	0.0000	I(1)
TDS	-4.110513	-2.957110	0.0032	I(1)
TDB	-4.325805	-2.943427	0.0015	I(1)
EXR	-3.809747	-2.943427	0.0061	I(0)

Source: Output from Eview 10 (2024)

4.4 Bound Test Cointegration Analysis

In order to determine the existence of long run relationship between a set of variables, the cointegration test is carried out. If a long run relationship exists, then the set of variables are said to be co-integrated. In this study, the bound test co-integration analysis is used to test for the existence of long run relationship among the variables. The null hypothesis states that there is no cointegration among the set of variables ($H_0 = \beta_1 + \beta_2 + \beta_3 = 0$), while the alternate states that there is cointegration ($H_0 = \beta_1 + \beta_2$

+ $\beta_3 \neq 0$). The decision rules are; if the value of the F-Statistic is greater than the value of the upper bound [I(1)], then it is concluded that there is cointegration (long run relationship) among the variables. However, if the value of the F-Statistics lies below the lower bound [I(0)], then cointegration does not exist. Furthermore, if the value falls in between I(0) and I(1), the test is considered to be inconclusive. Consequently, ARDL co-integrated approach was used for this study. The ARDL cointegration output is presented in Table 4.

Table 4: ARDL Bound Test Output

F-Bounds Test		Null Hypothesis: No relationship	No levels
Test Statistic	Value	Signif.	I(0) I(1)
F-statistic	10.75559	10%	2.72 3.77
K	3	5%	3.23 4.35
		1%	4.29 5.61

Source: Output from E-view 10 (2024)

The results in Table 4 showed that there is long run relationship among the variables to be estimated. This is because the value of the F-Statistics which is 10.75559 is greater than the value of the upper bound which is 4.35, at 5 percent significance level. Thus, the

In view of the co-integrating relationship among the variables, the study proceeds to estimate the Error Correction and long run models which are means of reconciliating the short-run behavior of variables to its long run behavior. The ECM is used through the coefficient of the error correction term (ECT) to adjust

null hypothesis of no cointegration is rejected and the alternate hypothesis of the existence of cointegration is accepted. Therefore, it can be concluded that there is long run relationship among the variables.

4.5 Error Correction Mechanism (ECM)

from short run to long run should there be any disequilibrium in a system. As a rule, the value of the ECT is expected to be negative, less than unity and also statistically significant at 5% level. Table 8 is the ARDL-ECM Output.

Table 5: ARDL – ECM Long Run Results

Dependent Variable: FDI

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	235.9416	171.7076	1.374089	0.1884
D(FDI(-1))	-0.193099	0.119308	-1.618491	0.1251
D(FDI(-2))	0.302793	0.120180	2.519493	0.0228
D(FDI(-3))	0.371900	0.116952	3.179933	0.0058
D(TDS)	2.841690	1.640351	1.732367	0.1024
D(TDS(-1))	-9.070540	2.215023	-4.095010	0.0008
D(TDS(-2))	-18.96595	2.815118	-6.737177	0.0000
D(TDS(-3))	-8.861990	2.504853	-3.537928	0.0027
D(TDB)	-1.674657	0.250865	-6.675519	0.0000
D(TDB(-1))	1.724394	0.324742	5.310040	0.0001
D(TDB(-2))	0.896482	0.412157	2.175098	0.0450
D(TDB(-3))	1.162488	0.235659	4.932926	0.0001
D(EXR)	59.92167	10.67556	5.612980	0.0000
D(EXR(-1))	-62.21206	10.94275	-5.685233	0.0000
D(EXR(-2))	-50.53632	14.42274	-3.503933	0.0029
CointEq(-1)*	-0.822553	0.115080	-7.147661	0.0000
R-squared	0.885289			
Adjusted R-squared	0.794727			

F-statistic	9.775551	Durbin-Watson stat	2.388816
Prob(F-statistic)	0.000006		

Long Run Form

TDS	14.32328	3.051690	4.693555	0.0002
TDB	-2.190928	0.453848	-4.827453	0.0002
EXR	85.83146	10.80927	7.940541	0.0000

Source: Output from Eview 10 (2024)

In Table 5, the coefficient of the error correction term (ECT) is -0.822553. This value indicates that it will take an average speed of 82% for the system to adjust from short run to long run should there be any disequilibrium. The coefficient of determination (R-square) value of 0.885289 means that total debt service, total debt and exchange rate collectively accounted for

The Wald test was used to test the two hypotheses for this study. The decision rule is that the value of the F-statistics must be less than 5% for the result to be

88.5% of the total variation or changes in foreign direct investment during the period under review, while the remaining 11.5% is accounted for by the error term. Furthermore, the value of the F-statistics, with its corresponding probability value of 0.000006 indicates that the parameters of the estimated model are statistically significant at 5% level.

4.5 Test of Hypotheses

statistically significant; hence the null hypothesis will be rejected while the alternate accepted. The outputs of the tests are presented in Tables 6.

Table 6: Wald Test Results

Variables	F-Statistics	D.f	Probability
TDS	5.326388	(4, 16)	0.0064
TDB	7.354464	(4, 16)	0.0003

Source: Output from E-view 10 (2024)

In hypothesis 1 (H_{01}), the null hypothesis states that total debt service has no significant impact on foreign direct investment. In Table 6, the probability value of the F-statistics which is 0.0064 is less than 5% ($0.0064 < 0.05$). Hence, the null hypothesis of no significant impact is rejected. This means total debt service has significant influence on foreign direct investment. Likewise, based on hypothesis 2 (H_{02}) which states that

total debt has no significant impact on foreign direct investment, the result in Table 10 revealed that total debt has significant influence on foreign direct investment. This is so because the probability value of the F-statistics which is 0.0015 is less than 5%. Hence the null hypothesis is rejected and the alternate accepted that total debt has significant impact on foreign direct investment.

4.7 Diagnostic Tests

Before drawing conclusion from any estimated regression model, it is important to perform relevant post-estimation or diagnostic tests to verify the validity

of the regression model. Thus, there is the need to test for the normality test, serial correlation test, heteroscedasticity test and stability test.

Table 7: Diagnostic Checks for Debt Service and Public Investment

Tests		Outcomes	
		Coefficient	Probability
Breusch-Godfrey Serial Correlation LM Test	F-Stat.	1.643367	0.2184
Heteroskedasticity Test: Breusch-Pagan-Godfrey	F-Stat.	2.043337	0.0740
Normality Test	Jarque-Bera	0.281087	0.868886

Source: Output from Eview 10 (2024)

One of the requirements in regression model is to verify the presence of serial or autocorrelation. That is, to know if the value which the error term assumes in any one period is independent of the value which it assumed in any previous period. The implication of the existence of serial correlation is that the model is mis-specified and the estimated variances of the regression coefficients will be biased and inconsistent. The null hypothesis states that “there is no serial correlation in the model”. The probability values of the F-statistics and the Obs*R-squared are used to decide acceptance or rejection of the null hypothesis. If the probability values are greater than 5% level of significance ($PV > 0.05$), the null hypothesis cannot be rejected. This test is employed to find out if the error term exhibits constant variance. If the variance of the error terms is not constant, there is presence of heteroscedasticity. However, if the variance of the error terms is constant,

then there is presence of homoscedasticity. The null hypothesis states that “there is no heteroscedasticity among the error terms in the model. Normality test is executed using the Jarque-Bera (JB) statistics to establish whether the residuals are normally distributed or not. The null hypothesis states that “the error terms are normally distributed”. The probability value (PV) of the JB is used to determine the level of significance. If the probability value is greater than the 5% level of significance (that is $PV > 0.05$), it implies that the error term is normally distributed; otherwise, it is not normally distributed. The probability value of the Jarque-Bera statistics is 0.868886 which is greater than 5% ($0.868886 > 0.05$). Therefore, the null hypothesis which states that the error terms are normally distributed cannot be rejected. Hence, it can be concluded that the error term of the model is normally distributed.

4.6 Discussion of Findings

Table 5 is the short run and long run estimated regression results of the study. The coefficient of the total debt service which is 14.32328 and its corresponding probability value of 0.0002 showed that positive and significant relationship exists between total debt service and foreign direct investment. Specifically, the results indicates that holding other variables constant, when total debt service increases by a billion naira, foreign direct investment will increase by 14.323 billion naira. This could be due to the fact that out of the amount of funds allocated for debt servicing, substantial amount was always allotted for external debt servicing. These funds could further be channeled back

to the host country for investment purposes by the foreign creditors. This finding s in line with the study of Efuntade et al. (2021), who found debt servicing to have positive and significant impact on economic growth. Also, the coefficient of total debt which is - 2.190928 and its probability value of 0.002 indicate that total debt has a negative and significant impact on foreign direct investment. When total debt increases by a billion, foreign direct investment will decrease by 219.09 billion naira. This shows that increasing debt discourages foreign direct investment because returns from investment in the host country will be taxed away by host government. This study aligned with that of

Emmanuel and Idebi (2023), who found foreign direct investment to have negative relationship with debt services. Furthermore, the coefficient of exchange rate (85.83146) and its corresponding probability value of 0.0000 indicate that exchange rate and foreign direct investment has a positive and significant relationship.

The study investigated the relationship between debt servicing and foreign direct investment in Nigeria using the auto-regressive distributed lag model and the error correction mechanism to analyze the data. The findings revealed that total debt service has positive and significant impact on foreign direct investment, while total debt has negative and significant impact on foreign direct investment in Nigeria during the period under review. Based on the findings, the study therefore made the following recommendations:

i. The federal government should improve its revenue by diversify its streams of income in order to fund

Increase in exchange rate by 1 percent will lead to increase in foreign direct investment by 858.3 billion naira. This finding is in accordance with the study of Okonkwo et al. (2021), who found exchange rate to have positive and significant impact on foreign direct investment.

5. Conclusion and Recommendations

majority of the expenditures with generated revenue. By so doing, borrowing with its associated debt service payment obligations will be minimized

ii. The Debt Management Office which is saddled with responsibility of managing the country's debt should advise the federal government to minimize borrowing in order to attract foreign direct investment. This is so because a country that is experiencing high debt overhang discourages foreign investors from investing in the country discourages foreign investors from investing in the country.

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