Budget Deficit and Private Domestic Investments in Nigeria: An Empirical Analysis

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Abstract

The impact of budget deficit and private domestic investment in Nigeria between 1981 and 2022 were examined in this study. The Central Bank of Nigeria (CBN)'s statistical bulletin provided the secondary data used for the study. The data were analyzed using the Autoregressive Distributed Lag (ARDL) model and the Augmented Dickey-Fuller (ADF) unit root test. Variables such as budget deficit and inflation rate were integrated at order zero, while others were integrated at order one, according to the unit root result. The long-term linkages between the variables were found using the ARDL Bounds test for co-integration. The short-run outcome demonstrated that public debt and the budget deficit had a significant detrimental impact on domestic private investment. Inflation rate and private domestic investment also had a positive but insignificant relationship. However, during the study period, there was a positive and significant link between the exchange rate and private domestic investment in Nigeria. The report made several recommendations based on its results, including that the government provide a larger portion of its funds to the productive sectors that directly affect the economy.

Keywords: Investments, budget, deficit, debt & government

Introduction

Effective utilization of private resources (private investment) in the economy is one of the primary forces behind growth and sustainable development in any given economy (International Monetary Fund, 2023). This is due to the fact that growth driven by the private sector affects the economy more than growth driven by the public sector (Boma, Ahmed & Bidemi, 2021). This has typically been explained by the observation that efficiency levels in the public and private sectors are generally lower. Therefore, there have been recent shifts in emphasis from public sector to private sector led growth strategies that emphasize the supremacy of market forces in the economy and a decline of public sector in production, particularly in emerging nations (Kasali, 2020).

An extreme downturn in economic growth faced several developing nations. Nigeria experienced a decline in per capita GDP from $1100 to $340 during the 1980s oil glut (Adeniyi, 2000). Similarly, the price of crude oil on the global market is currently less than $40 per barrel between the first and fourth quarters of 2020, compared to $120 per barrel in the third quarter of 2014 and $82.95 per barrel in 2023 (Organization of Petroleum Exporting Countries, 2023). Due to this, the country's real GDP growth rate fell below average, resulting in a recession during the second quarter of 2016 and 2017. The notable decline in gross rates of investment could perhaps be attributed to many variables influencing the Nigerian economy during this time frame. Realizing that a change in strategy was necessary, the country turned its attention to developing the private sector. The adoption of the Structural Adjustment Programme in Nigeria in 1986 is one of the policies intended to encourage the private sector by commercializing and privatizing public enterprises (Onyele, Ikwuagwu & Onyekachi-Onyele, 2020).

One of the most frequently discussed subjects among economists and decision-makers in both rich and emerging nations is the connection between budget deficits and private domestic

investment (Abubakar & Mamman, 2021). This relationship may be beneficial or detrimental. The Nigerian government has always placed a greater emphasis on fiscal policy while addressing its economic problems (Alade, 2017; Musa, Asare & Gulumbe, 2013). One question that keeps coming up, though, is whether higher public deficits are inevitably linked to higher levels of private domestic investment. Furthermore, since private investment is sensitive to the real interest rate, which rises under domestic borrowing to pay the deficit, the government supports private investment but discourages private consumption. In Nigeria, private investment rises when public investment falls, defying popular belief. Therefore, there is compelling evidence that external deficits resulting from fiscal deficits drive up real exchange rates and discourage private investment at home.

Meanwhile, empirical findings such as Nwaeke (2023), Monogbe, Dornubari and Emah, (2015) showed that budget deficit has a positive influence on investment in Nigeria. However, research by Abubakar and Mamman (2021); Boma et al (2021); Kasali (2020); Akinmulegun (2014); and Paiko (2012) demonstrated that a budget deficit does not encourage investment in Nigeria. As a result, the recurrent queries are: Is there a constant correlation between higher levels of governmental deficits and higher levels of private domestic investment? When the government relies largely on domestic debt instruments, do deficits raise real interest rates and exchange rates domestically? This study is driven by the answers to these questions. Hence, the study's specific objectives are to: examine the effect of budget deficit on domestic private investment in Nigeria from 1981 to 2022.

Literature Review

In an attempt to achieve macroeconomic equilibrium, a budget deficit occurs when predicted current expenditures are more than expected current income. In the meantime, the budget, or fiscal policy, is a well-known tool for raising a nation's pace of economic growth (Momodu & Monogbe, 2017). Stated differently, a fiscal imbalance occurs when projected current spending surpasses projected current income in an attempt to achieve macroeconomic equilibrium (Obinabo & Agu, 2018; Saysombath & Kyophilavong, 2013). In terms of finances, it is also the circumstance in which the government's overall budget surpasses its total receipts, exclusive of borrowings taken out throughout the fiscal year (Onyele, Ikwuagwu & Opara, 2023). As a result, the formula for calculating the fiscal deficit is as follows: total expenditure minus total receipts excluding borrowings. The government can calculate the amount that needs to be borrowed in the event that it does not have enough money by using the fiscal deficit (Abubakar & Mamman, 2021). If the following circumstances hold true, there may be a fiscal deficit even in the absence of a revenue shortfall (Uremadu & Onyele, 2019). Private investment, as defined by macroeconomics, is the acquisition of a capital asset with the expectation that it would increase in value, create income, or do both. Capital assets include things like real estate, buildings, machinery, and equipment (ThankGod, 2014; Huntley, 2014).

Theoretical Review

This study is anchored on the Ricardian Equivalence theory. The theory was propounded by David Ricardo and later worked on by Barro (1989). According to the hypothesis, a budget deficit frequently results in lower government savings, which in turn causes desire private savings to rise. As a result, the desire for national saving and investment does not change. This is due to the fact that financing a deficit entails more government spending than revenue from taxes. The deficit would be paid for by borrowing money, which would then be repaid by future tax increases (Barro, 1989). According to the hypothesis, people would always maintain their lifetime consumption patterns and, since future tax increases would be used to repay the borrowed funds, an expansionary fiscal policy would not have an impact on people's current

spending because they would be saving for the inevitable tax increases in the future (Albato, 2012; Isah, 2012).

Keynesian Theory of Budget Deficit

The notion of budget deficit was first developed by John Maynard Keynes in 1936 (Keynes, 1936). His theory of the budget deficit was predicated on two key tenets: first, it takes the possibility that some resources do not have unemployment. Secondly, it assumes that there are a lot of people who are myopic and have little liquidity (Vincent & Clem, 2013). In 1936, Keynes stated that a nation's massive public debt should be viewed as an asset rather than a problem. Keynes said that the secret to a country's quick economic growth and development is consistent spending. Keynes' perspective differs from the classical schools. The government's involvement in the economy was frowned upon by classical economists. In light of the events of the Great Depression, Keynes firmly maintained his belief that economic growth and progress in a nation are contingent upon government intervention in the economy. According to Yellen (2012), a boost in aggregate demand causes private investments to become more profitable, which raises the amount of investment at any given interest rate.

Empirical Review

In the literature, Nwaeke (2023) looked into how the budget deficit and FDI affected the economy of Nigeria from 1990 and 2022. The dimensions and measures employed were real gross domestic product, inflation rate, government deficit finance, exchange rate, and foreign direct investment, in that order. ARDL analysis was the technique employed. The estimates' findings showed that, over time, the real gross domestic product of the Nigerian economy was negatively impacted by the inflation rate, but positively and significantly by the exchange rate, FDI, and government deficit financing.

The budget deficit and private domestic investment in Nigeria from 1981 to 2019 were examined by Boma *et al* (2021). The data were analyzed using the econometric ARDL model. The long-term link between the variables was found using the ARDL Bounds test for co-integration. The short-term outcome demonstrated a weak but unfavourable relationship between the budget deficit and private domestic investment. Interest rates and private domestic investment were also inversely correlated. However, during the study period, there was a positive and negligible correlation between the exchange rate and private domestic investment in Nigeria.

In Nigeria, the impact of governmental debt on private investment was calculated by Abubakar and Mamman (2021). The series from 1981 to 2018 is analysed using both linear and non-linear ARDL models. The estimation results demonstrated a symmetric negative relationship between private investment and rising levels of overall debt, foreign debt, and debt service payments. However, it was shown that there was an uneven impact of domestic debt on private investment. A positive shock had a negligible beneficial impact on private investment, despite the fact that a negative shock to domestic debt significantly increased private investment.

The impact of Nigeria's fiscal deficit on investment was examined by Kasali (2020), who specifically sought to ascertain the impact of the deficit on foreign direct investment, private domestic investment, and the relationship between public and private investment in Nigeria from 1980 to 2015. The analysis used macroeconomic data from 1980 to 2015 and utilised Dale Jorgenson's neoclassical theory of investment methodology. It used ARDL Bounds testing approach to cointegration and Dickey Fuller Generalized Least Square (DFGLS) and Ng-Perron unit root tests as estimation approaches. The econometric data showed that, in the near run, private domestic investment was negatively impacted by the fiscal deficit. On the other

hand, over time, budget imbalance increased foreign direct investment. In Nigeria, domestic private and public investments are separate entities.

Error Correction Model Approach (ECM) was utilized by Ugwu and Efuntade (2017) to investigate the impact of Nigeria's budget deficit on the currency rate between 1980 and 2017. According to the results of the stationarity test, every variable is integrated of order one and stationary at the 5% significance level. There are five co-integrating equations at the 5% significant level, according to the Johansen hypothesized co-integration test result. The long-term research indicates that trade openness, money supply, and budget deficit all have positive coefficients. However, there are warning indicators of inflation and consumption spending.

Omojolaibi, Okenesi, and Mesagan (2016) used annual data from 1993 to 2014 using a fixed effect model for panel data ordinary least square technique to investigate the relationship between fiscal policy and private investment in five selected West African countries. The findings indicated that tax revenue and government capital expenditures had a considerable crowding-in effect, while non-tax revenue had a crowding-out effect. Although they were negligible, ongoing expenses and external debt also displayed crowding out effects. Over the course of the study, it was also discovered that the accelerator effect of output growth was negligible in all of the countries.

Using the Error Correction Model (ECM), Dantama, Gatawa and Galli (2016) examined the effects of Nigeria's fiscal deficit on private investments from 1980 to 2014. According to the ECM result, 38% of the mistakes were fixed from the short-run adjustment to the long-run. It further demonstrated that, over time, private investments were crowded out by increases in government spending while they were crowded in by increases in the fiscal deficit, government revenue, and exchange rate.

Kelikume (2016) investigated how interest rates in Sub-Saharan African nations were impacted by budget deficits using VAR. In eighteen nations, panel data was gathered between 2000 and 2014. The outcome demonstrated the insensitivity of interest rates to the budget deficit of the government. Furthermore, interest rates reacted favourably to inflation, money supply, and currency rates.

Ejuvbekpokpo, Sallahuddin, and Clark (2015) looked at how Nigeria's fiscal policy affected investment spending from 1970 to 2010. The study found that higher government spending or the adoption of a budget with a deficit increased investment spending. However, in defining fiscal policy and its impact on investment, the research overlooked important factors such domestic loans to the private sector and external debt.

Budget Deficits and Private Investments in Nigeria: Stylized Facts

The budget deficit is shown in Table 1. Generally speaking, deficit budgeting was negative, meaning that because the nation had to borrow money, expenditures had outpaced revenues. For this reason, Nigeria had a deficit between 1981 and 2022. Between 1981 and 1994, the budget deficit increased from -₦3.90 billion to -₦70.30 billion, with positive numbers recorded in 1995 and 1996 (-₦1.00 billion and -₦32.00 billion, respectively). The budget deficit began to decline in 1996 and was worth -₦5.00 billion. This trend persisted until 2022, when it peaked at -₦9,319.60 billion (CBN, 2022).

The collapse of the global oil market in the early 1980s put Nigeria's economy in the deficit trap, as figure 1 illustrates. Since then, desperate attempts have been made, but to no avail, to break free of the trap. However, the main causes of rapid monetary growth, depreciating currency rates, and growing inflation are also responsible for Nigeria's fiscal policy adoption in financing deficits. Generally speaking, in the case of Nigeria, it has been asserted that

growing fiscal imbalances, sources of financing for the deficit, private investments, and the depreciation of the currency rate were the primary reasons of these high rates of inflation (Onyele & Ariwa, 2020). However, during this time, the economy as a whole underperformed due to growing budget deficits, which were made worse by subpar macroeconomic management and political unpredictability.

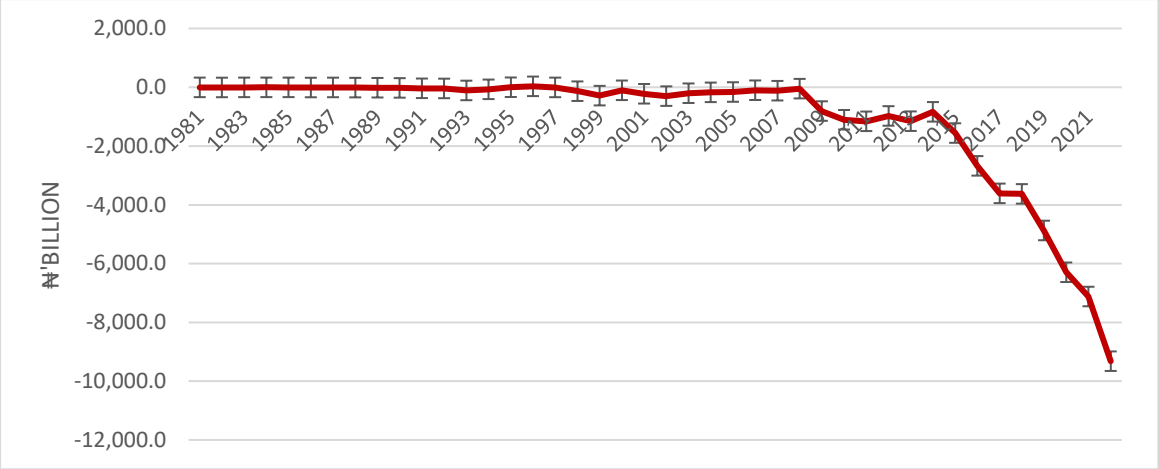

Figure 1: Trend of budget deficit in Nigeria

Source: Central Bank of Nigeria Statistical Bulletin

Nigeria has debts that go back to the time before its independence. Prior to 1978, Nigeria's debts were very modest and mostly consisted of long-term loans from official and multilateral sources like the World Bank and its principal trading partners. Since the loans were mostly received on favourable conditions, the economy was not burdened by them (Onyele & Nwokoacha, 2016). Nonetheless, the government obtained the first jumbo loan in 1977–1978 from the international capital market, totaling US$1.0 billion, as a result of the decline in oil prices and oil receipts. Numerous medium- to long-term infrastructure projects were financed with the loan.

Concern over Nigeria's growing state debt has grown over the last several decades. Nigeria's governmental debt increased significantly for the first time in 1987, reaching ₦137.58 billion. From that point on, Nigeria's public debt increased steadily, reaching ₦6,260.59 billion as of 2004. Nigeria's total debt dropped dramatically between 2004 and 2006, reaching ₦2,204.72 billion in 2006 thanks to the debt forgiveness. Interestingly, domestic debt grew unabatedly as external debt decreased, reaching ₦6,519.65 billion in total by 2011. This eclipsed the level of debt in 2004. Nigeria's total debt reached a record high of ₦40,912.62 billion by 2022 (CBN, 2022).

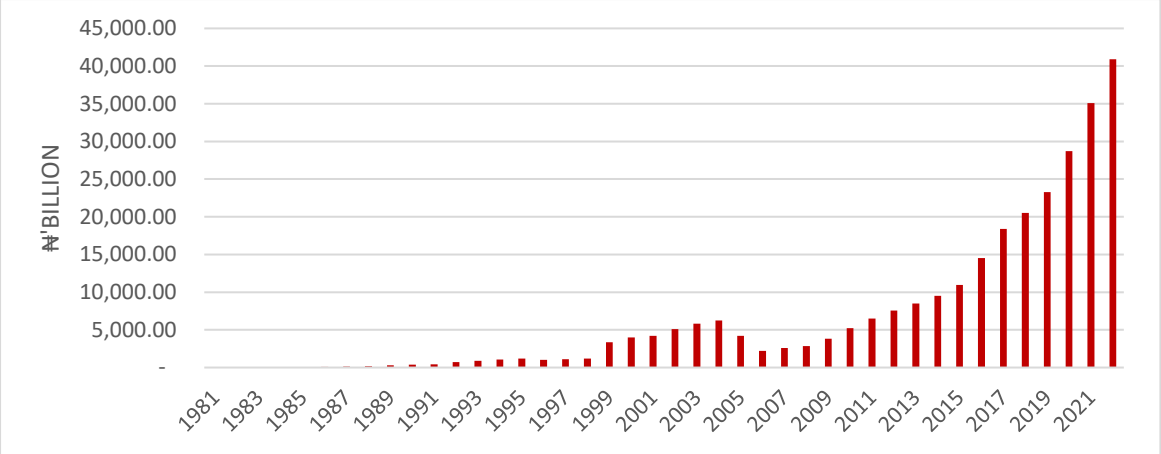

Figure 2: Trend of total public debt in Nigeria

Source: Central Bank of Nigeria Statistical Bulletin

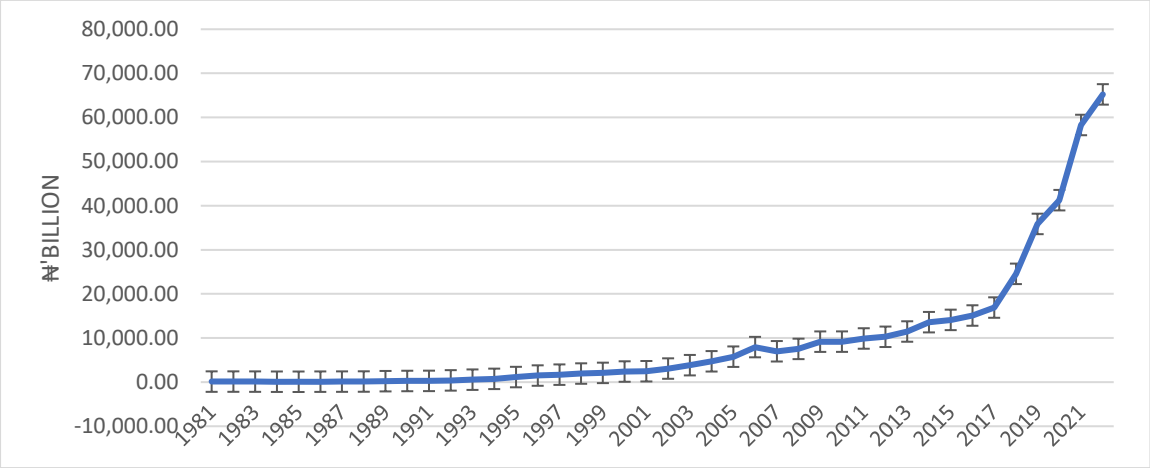

Figure 3: Trend of total private investment in Nigeria

Source: Central Bank of Nigeria Statistical Bulletin

According to Paiko (2012), implementing a deficit budget should have a favourable impact on development indices, including private investment. The upward trend in private investment in Nigeria throughout the reviewed period suggests that deficit spending has yielded the intended impact on economic growth. The public may or may not be affected by this effect; that is up for discussion. The rise in private investments (Figure 3) may be explained by an increase in income from the rent-seeking activities that are common in the upstream and downstream segments of the oil industry.

Methodology

The study majorly relied on secondary data. The data were gathered from the Central Bank of Nigeria (CBN)'s statistical bulletin and covered the years 1981 to 2022. The secondary data gathered from the CBN statistical bulletin were analyzed using the econometric technique of the ARDL model. The time series were thought to be stationary at level and first difference, which led to the technique selection. Data on private domestic investment and the budget deficit in Nigeria from 1981 to 2022 were used. Private domestic investment (PDI) is the dependent variable. Budget deficit (BDF) and public debt are the core independent variables while the exchange rate (EXR) and inflation rate (IFR) were used as control variables. A control variable

(or scientific) in scientific experimentation is an experimental element which is constant (controlled) and unchanged throughout the course of the investigation.

Model Specification

The Autoregressive Distributed Lag (ARDL) model was used as the model specification in this study. This was due to the fact that some time series were integrated at the level of the stationary state (I(0)), while others were integrated at the first difference (I(1)). The model that is specified is as follows:

PDI = f(BDF, DBT, IFR, EXR) (1)

In the meantime, a log-linear equation specifies the long-run co-integration and short-run error correction model (ECM) ARDL model as follows:

$$\Delta lnPDI_t = \beta_0 + \beta_1 lnPDI_t + \beta_2 lnBDF_t + \beta_3 lnDBT_t + \beta_4 lnIFR_t + \beta_5 lnEXR_t + \sum_{i=1}^{n} \Delta\varphi_1 lnPDI_{t-1} + \sum_{i=1}^{n} \Delta\varphi_2 lnBDF_{t-1} + \sum_{i=1}^{n} \Delta\varphi_3 lnDBT_{t-1} + \sum_{i=1}^{n} \Delta\varphi_4 lnIFR_{t-1} + \sum_{i=1}^{n} \Delta\varphi_5 lnEXR_{t-1} + ECM_{t-1} + \mu_t \quad \text{(2)}$$

Where;

PDI = private domestic investments;

BDF = budget deficit;

DBT = total public debt;

INF = inflation rate;

EXR = exchange rate;

β_0 = constant;

$\beta_1 - \beta_5$ = long-run coefficients;

$\varphi_1 - \varphi_5$ = short-run coefficients of the regressors;

Δ = First difference operator;

n = maximum lag lengths;

μ_1 = white noise;

ECM = error correction term lagged for one period; and,

ln = natural logarithm

Result of the Findings

Summary Statistics

To examine the characteristics of the study variables in the study, descriptive statistics were employed to measure the skewness, standard deviation, and average (mean), among other measures.

Table 1: Summary statistics

	PDI	BDF	DBT	IFR	EXR
Mean	9321.227	1126.995	6740.283	18.96619	115.7412
Median	2776.125	125.3132	3107.870	12.88000	115.2550
Maximum	65227.13	9319.552	40912.62	72.84000	425.9800
Minimum	87.14000	1.000000	13.52000	5.390000	0.610000
Std. Dev.	15038.99	2152.180	9816.273	16.46796	119.1408
Skewness	2.422943	2.370634	2.031677	1.869115	1.021357
Kurtosis	8.418618	7.944249	6.478005	5.412319	3.221275
Jarque-Bera	92.47706	82.11913	50.06290	34.63888	7.387874
Probability	0.000000	0.000000	0.000000	0.000000	0.024874
Observations	42	42	42	42	42

Source: Researcher's Extraction from EViews 10.

All of the variables have positive values according to the Skewness test result. Furthermore, given the approximate values for kurtosis values are less than 3, all the variables are leptokurtic relative to normal based on the kurtosis analysis. This implies that the tails of the variables are lengthy and fat. The Jarque-Bera statistics probability indicated that the variables' normal distribution null hypotheses were rejected at the 5% level. The time series are therefore essentially not normally distributed, it was concluded. A unit root issue or stationarity issue could be the source of this.

Stationarity Test

The Augmented Dickey Fuller (ADF) was used in this unit root test to ascertain the variables' order of stationarity. Based on a constant and temporal trend, the ADF test was carried out at level and first difference at 5% crucial values. Table 2 displays the data series' stationarity status:

Table 2: Results of ADF unit root test for stationarity

Variable	ADF @ level		ADF @ first difference		Order
	Critical value	Prob. value	Critical value	Prob. value	of integration
PDI	-2.241536	0.4547	-4.141398	0.0117	I(1)
BDF	-5.110183	0.0008	-	-	I(0)
DBT	-2.193813	0.4799	-4.730956	0.0025	I(1)
IFR	-3.516069	0.0124	-	-	I(0)
EXR	-1.419903	0.8400	-5.814717	0.0001	I(1)

Source: Researcher's Extraction from EViews 10.

Only the budget deficit (BDF) and inflation rate (IFR) were found to be stationary at level or order zero in the Augmented Dickey Fuller (ADF) test of stationarity for the variables shown in Table 2. Exchange rates (EXR) and private domestic investment (PDI), which were not stationary at level, were stationary at first differences after being differentiated once (1). As a result, the findings of the ADF test demonstrate that the data series were of mixed integration, or a blend of I(0) and I(1) variables. Because of this situation, the ARDL estimate approach must be used (Pesaran *et al.,* 2001).

ARDL Estimation

Bounds test

The study next tested the ARDL boundaries to see if there would be a long-term link between the variables understudy after determining the stationarity status of the variables. Here, if the F-test is higher than the critical value at the 5% level of the I(0) and I(1) regressors, the null hypothesis of the absence of cointegration is rejected, and vice versa. Table 3 displayed the results of the bounds testing:

Table 3: Bounds test for cointegration

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	10.91919	10%	3.03	4.06
K	4	5%	3.47	4.57
		2.5%	3.89	5.07
		1%	4.4	5.72

Source: Researcher's Extraction from EViews 10.

Using private domestic investment (PDI) as the dependent variable, the bound test for co-integration test revealed that, with a restricted intercept and no trend in the model specification, the F-statistic value of 10.91919 is higher than the upper bound critical value of 4.57 at the 5% level of significance. This indicates that there are long-term relationships between all of the variables in the model.

Long-run estimate of the ARDL model

After confirming the cointegration of the variables under examination, the long-run estimates of the ARDL were produced and are shown in Table 4:

Table 4: Long –run estimates of the ARDL model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNBDF	0.348241	0.115579	3.013018	0.0057
LNDBT	0.432853	0.229438	1.886580	0.0704
LNIFR	0.404454	0.163497	2.473765	0.0202
LNEXR	0.146384	0.184980	0.791348	0.4359

Source: Researcher's Extraction from EViews 10.

The budget deficit (BDF) coefficient is positively signed with PDI, according to the predicted ARDL long run coefficients. Furthermore, considering that the probability of the BDF's t-statistic is smaller than at the 1% (0.01) level, the budget deficit is important at the 1% level of

significance in explaining the amount of private domestic investment in Nigeria during the study period. Furthermore, the coefficient of DBT showed a positive trend and a probability value (0.0704) that was marginally significant at the 5% level of significance, meaning that DBT had an impact on private domestic investment in Nigeria. Therefore, the results suggest that, throughout the course of the study period, the BDF had a significant long-term impact on PDI.

Additionally, based on the results, private domestic investment has a positively signed coefficient of IFR. This shows that a rise in interest rates will result in a decline in domestic private investment. Additionally, since the inflation rate's probability (0.0202) of the t-statistic is smaller than at the 5% level, the inflation rate plays a substantial role in explaining the amount of private domestic investment in Nigeria over the course of the study. Additionally, there is a positive correlation between private domestic investment and the EXR, with a probability value of 0.4359 > 0.05. This implies that there will be an insignificant rise in private domestic investment in Nigeria if the value of the Nigerian naira is comparatively weak relative to internationally recognized trade currencies like the US dollar. Furthermore, the level of private domestic investment in Nigeria was not significantly explained by the absolute value of the exchange rate t-statistic. This suggests that EXR had no impact on PDI over the long term, but DBT and INFR were having significant effects.

Error correction mechanism (ECM)

The ARDL ECM was used to determine the short-run relationship amongst the variables in the estimated as shown in Table 5.

Table 5: Error correction mechanism

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.485436	0.059895	8.104849	0.0000
D(LNBDF)	0.045084	0.015182	2.969534	0.0063
D(LNBDF(-1))	-0.043136	0.020220	-2.133368	0.0425
D(LNBDF(-2))	-0.038372	0.014870	-2.580521	0.0159
D(LNDBT)	-0.184968	0.098980	-1.868747	0.0730
D(LNIFR)	0.027523	0.025263	1.089462	0.2859
D(LNEXR)	0.313380	0.089104	3.516996	0.0016
ECM(-1)	-0.314277	0.039597	-7.936959	0.0000
R-squared	0.707824			
Adjusted R-squared	0.629910			
F-statistic	9.084715			
Prob(F-statistic)	0.000003			
Durbin-Watson stat	1.960553			

Source: Researcher's Extraction from EViews 10.

According to the findings displayed in the above table, the budget deficit (BDF) has a positive relationship with PDI and a negative relationship—both statistically significant—with PDI after one and two period lagged coefficients of BDF. Therefore, during the study period, private

domestic investment in Nigeria was significantly impacted by the short-term budget deficit. This is a real feature of the Nigerian economy, where government spending frequently outpaces its ability to generate money, leading to a host of macroeconomic issues. The study corroborated the empirical work of Nwaeke (2023); Dantama *et al* (2016); Ejuvbekpokpo *et al* (2015) who also found a positive association between budget deficit and private domestic investments. On the other hand, Boma *et al* (2021), Omojolaibi *et al* (2016) found that budget deficit was detrimental to PDI in the short-run.

The short-run coefficient of the DBT indicated a statistically negligible negative impact on private domestic investment. This suggests that DBT had no short-term reducing impact on domestic private investment with a p-value of 0.0730 > 0.05. This may be explained by the substantial debt servicing costs that come along with large public borrowings. This is consistent with research by Onyele, Ikwuagwu, and Opara (2023), who found that excessive debt prevents investments in Nigeria. However, Abubakar and Mamman (2021) discovered that Nigerian PDI was positively impacted by national debt.

Furthermore, there was a slight but positive link between the IFR and the PDI. This suggests that for every unit increase in IFR, there was no significant increase in PDI in Nigeria with a probability value. Nonetheless, the results demonstrate a strong and positive correlation between the EXR and the PDI. This suggests that the strong value of the naira in relation to the US dollar will lead to greater PDI in Nigeria. Furthermore, the absolute value of the exchange rate t-statistic provides a statistical explanation for the quantity of PDI in Nigeria throughout the study period. Based on the positive and significant correlation between exchange rates and PDI, it can be concluded that exchange rates are an important monetary policy variable that can be used to improve PDI in Nigeria.

In the meantime, the short-run dynamic coefficients connected to the short-run connections derived from the ECM equation were displayed through the examination of the data in Table 5. The error correction term's coefficient is statistically significant and negatively signed. This essentially indicates that any short-term variation in PDI was brought to long-term equilibrium at a rate of 31% adjustment pace. As a result, there was a 31% correction rate in the current year for the disequilibrium in PDI from the prior year. Furthermore, the dynamic model has a strong fit, as indicated by the adjusted R-squared value of 0.629910. This means that the budget deficit and other related factors, such the total debt, the inflation rate, and the currency rate, account for roughly 63% of the variation in PDI.

With a Durbin Watson (DW) value of 1.960553, which is roughly equivalent to the 2.0 DW benchmark, the model is shown to be autocorrelation-free. Additionally, all of the explanatory factors are significant in explaining the growth in the amount of private domestic investment in Nigeria during the study period, as demonstrated by the probability of the F-statistic value of at 0.000003, which is less than 0.05 (5%) crucial values.

Post estimation test

In order to validate the ARDL short and long run estimations, as shown in Table 6, the study used the Breusch-Godfrey Lagrange Multiplier (LM) test for serial correlation, as well as the normality and heteroskedasticity tests as post-estimation tests.

Table 6: Post estimation test results

Test type	Test statistic	Prob.	Critical Value
Breusch-Godfrey Serial Correlation LM Test:	0.540188	0.5896	0.05
Heteroskedasticity Test: Breusch-Pagan-Godfrey	1.479686	0.1947	0.05
Jarque-Bera	0.909034	0.6347	0.05

Source: Researcher's Extraction from EViews 10.

The Breusch-Godfrey test for serial correlation (LM test) is used as a higher order test statistic to test the alternative hypothesis of serial correlation inferred from the ARDL model at the 5% level versus the null hypothesis of no serial correlation, based on the data shown in Table 6 above. The outcome demonstrated that the ARDL short-run and long-run models do not have a problem with serial autocorrelation. This is due to the fact that the model's F-statistic p-value of 0.5896 is higher than the critical value probability of 0.05.

Likewise, the Heteroskedasticity Test: Breusch-Pagan-Godfrey was utilized to investigate the homoscedasticity of the residual variance in the parsimonious ECM. As a result, the results of the Breusch-Pagan-Godfrey test for heteroskedasticity, which are displayed in Table 6, demonstrated that the ARDL model does not actually have a heteroskedasticity issue. This result implies that across the sampled period, the residual's variance is homoscedastic. This is as a result of the model's p-value of 0.1947 being higher than the critical value probability of 0.05.

Furthermore, the calculated model's residual is normally distributed, as demonstrated by the Jarque-Bera normality of the residuals. This is as a result of the model's p-value of 0.9090 being higher than the critical value probability of 0.05.

The ARDL model coefficients in each specification were stable, as evidenced by Figures 4 to 5 which showed that the cumulative number of recursive residues (CUSUM) and the cumulative number of recursive residues of squares (CUSUMSQ) for the ARDL models were within critical limits for the 5% significance level.

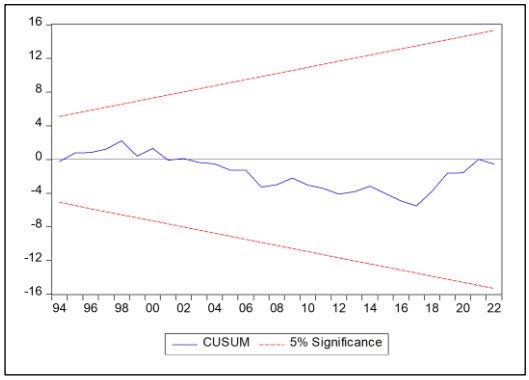

Figure 4: CUSUM test

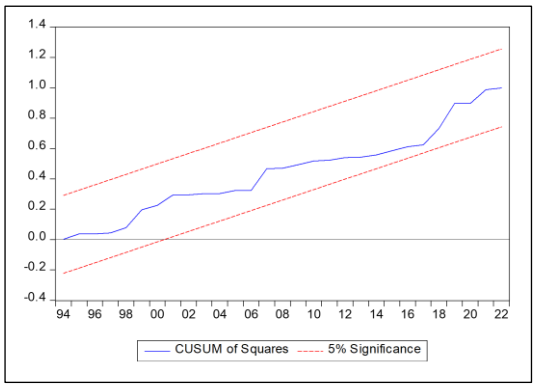

Figure 5: CUSUMSQ test

Conclusion

The budget deficit and private domestic investment study conducted in Nigeria between 1981 and 2022 showed that budget deficit enhanced growth of the Nigerian economy over time. The amount of private domestic investment in Nigeria increased as a result of the budget deficit, state debt, and exchange rate, according to empirical results from the ARDL model in both the short and long term. However, in the short term, the amount of private domestic investment in Nigeria was negatively explained by the budget deficit and state debt. The study's findings

indicate that Nigeria's unprofitable use of budget deficit over time has had an immediate negative impact on private domestic investment. This is because infrastructure development projects, like building new roads and electricity infrastructure, which directly affect the real sectors and help them increase output, which in turn spurs economic growth, have not been well-articulated over time.

Recommendations

The following recommendations are made.

i. The federal government should allocate more of its budget to the productive sectors that directly affect the economy, given the short-term negative correlation between budget deficit and private domestic investment;

ii. The federal government should be advised by Nigeria's Debt Management Office (DMO), which is in charge of overseeing the nation's debt, to reduce or forbid debt collection in order to finance its spending plans. Additionally, the borrowed money needs to go towards capital projects that support domestic private investment;

iii. The government, acting through the monetary authority, should force Nigeria's deposit money banks to lower their interest rates to one digit in order to curb the country's inflationary pressures. This will boost domestic economic output and, to a significant extent, lower the rate of inflation; and,

iv. To address the issue of exchange rate fluctuation in Nigeria's nominal exchange rate, monetary authorities, along with the CBN, should implement a managed floating exchange rate system.

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