Deposit Money Banks' Credit and Public Domestic Investment in Nigeria: Pre and Post Structural Adjustment Programme Analysis

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Abstract

This study investigates the influence of deposit money banks' credit on public domestic investment in Nigeria across three distinct time frames: the pre-Structural Adjustment Programme (SAP) period (1970–1985), the post-SAP period (1986–2022) and the entire study period (1970–2022). Utilizing annual time series data, the research applies the Error Correction Mechanism (ECM) and the Quandt-Andrews structural breakpoint techniques for analysis. Findings indicate that total credit to the economy, credit allocated to the agricultural and manufacturing sectors, and total savings within deposit money banks exert a positive and significant effect on public domestic investment in all examined periods. Conversely, the prime lending interest rate and the official Naira-to-US Dollar exchange rate had an adverse impact on public domestic investment across the analysed periods. The ECM coefficients for the respective time frames (-0.542794, -0.902596 and -0.940916) were negative and statistically significant at the 5% level, suggesting disequilibrium adjustments of 54.3%, 90.3% and 94.1%, respectively, from the short-run to the long-run equilibrium. The Quandt-Andrews structural breakpoint test identified 2007 as a structural break year, aligning with the global financial crisis, which had a profound effect on Nigeria's economy. Based on these findings, the study suggests that the Central Bank of Nigeria should implement effective strategies to manage prime lending interest rates and exchange rates to avoid disruptive structural breaks and foster stable public domestic investment.

Keywords: Public Domestic Investment, Deposit Money Banks' Credit, Credit to the Economy, Savings, Prime Lending Interest Rate, Official Exchange Rate.

JEL *Codes:* E22, G11 & O16.

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Crédito de los bancos de dinero de depósito y la inversión pública interna en Nigeria: análisis antes y después del programa de ajuste estructural

Resumen

Este estudio investiga la influencia del crédito de los bancos de depósito en la inversión pública nacional en Nigeria a lo largo de tres períodos distintos: el período previo al Programa de Ajuste Estructural (SAP) (1970-1985), el período posterior al SAP (1986-2022) y el período completo de estudio (1970-2022). Utilizando datos anuales de series temporales, la investigación aplica el Mecanismo de Corrección de Errores (ECM) y las técnicas de punto de quiebre estructural de Quandt-Andrews para el análisis. Los hallazgos indican que el crédito total a la economía, el crédito asignado a los sectores agrícola y manufacturero, y el ahorro total dentro de los bancos de depósito ejercen un efecto positivo y significativo en la inversión pública nacional en todos los períodos examinados. Por el contrario, la tasa de interés de préstamo principal y el tipo de cambio oficial Naira-Dólar estadounidense tuvieron un impacto adverso en la inversión pública nacional a lo largo de los períodos analizados. Los coeficientes ECM para los respectivos marcos temporales (-0.542794, -0.902596 y -0.940916) fueron negativos y estadísticamente significativos al nivel del 5%, lo que sugiere ajustes de desequilibrio del 54.3%, 90.3% y 94.1%, respectivamente, desde el corto plazo hasta el equilibrio de largo plazo. La prueba de punto de quiebre estructural de Quandt-Andrews identificó 2007 como un año de quiebre estructural, coincidiendo con la crisis financiera global, que tuvo un efecto profundo en la economía de Nigeria. Con base en estos hallazgos, el estudio sugiere que el Banco Central de Nigeria implemente estrategias efectivas para gestionar las tasas de interés de préstamo y los tipos de cambio para evitar quiebres estructurales disruptivos y fomentar la inversión pública nacional estable.

Palabras clave: Inversión pública nacional, Crédito de los bancos de depósito, Crédito a la economía, Ahorro, Tasa de interés de préstamo principal, Tipo de cambio oficial.

Códigos JEL: E22, G11 y O16.

1. Introduction

In recent years, issues related to banks' credit and investment have gained significant attention in Nigeria. Deposit Money Banks (DMBS) are financial institutions that provide retail banking services, including the safekeeping and lending of money to individuals, firms and organizations, primarily for profit-making purposes (Heffernan, 2005; Enyioko, 2012). These institutions include commercial banks, non-interest banks and merchant banks (CBN, 2022). Currently, 44 DMBS operate in Nigeria, licensed under various authorizations.

In Nigeria, seven commercial banks hold international authorization licenses, including Access Bank Plc, Fidelity Bank Plc, First City Monument Bank Plc, First Bank of Nigeria Limited, Guaranty Trust Bank Plc, United Bank for Africa Plc and Zenith Bank Plc. Additionally, fifteen banks operate under national authorization, with Ecobank Nigeria Limited, Heritage Bank Plc, and Stanbic IBTC Bank Limited among them. Four banks, such as Providus Bank Plc and Parallex Bank Limited, function with regional authorization. Furthermore, Jaiz Bank Plc, Taj Bank Limited, Lotus Bank Limited, and Alternative Bank Limited are non-interest banks licensed under national authorization. Six merchant banks, including Coronation Merchant Bank and Rand Merchant Bank, also hold national authorization, alongside seven financial holding companies and one representative office (CBN, 2024).

As highlighted by Adegboye, Olowe, and Uwuigbe (2013), deposit money banks (DMBS) play essential roles such as accepting deposits, safeguarding valuables, creating credit, issuing drafts, facilitating foreign exchange and offering financial advice. Loan disbursement decisions are shaped by factors such as prevailing interest rates, deposit volumes, liquidity ratios, and public perception. DMBS credit facilities, which include loans and overdrafts, are more accessible to account holders, particularly those with current accounts. Loans are bulk sums provided to customers meeting specific requirements, often secured with collateral, while overdrafts allow withdrawals exceeding account balances, attracting interest on outstanding amounts (Mamudu, 2021).

Investment, according to Heim (2008), involves acquiring goods for capital creation, fostering income generation within the domestic economy. Domestic investment, derived from aggregated domestic savings, encompasses private and public investments. Public domestic investment, often focused on infrastructure, aims to enhance employment, stabilize prices and promote growth, while private domestic investment targets business expansion (Effiom, Achu & Edet, 2020). However, public investment in Nigeria has often been critiqued for inefficiency, with significant expenditure failing to yield commensurate infrastructural development (Enya & Ezeali, 2021).

The Structural Adjustment Programme (SAP), initiated by the IMF and World Bank, aimed to reform Nigeria's economy by implementing changes in trade, foreign exchange policies and investment strategies. However, during the SAP era (1986–1993), deposit money bank (DMB) credit to public domestic investment was hindered by factors such as reduced government borrowing, high interest rates, and inflation. These limitations collectively reduced the effectiveness of bank credit in driving public domestic investment, restricting the government's capacity for strategic capital allocation.

This study investigates the impact of DMB credit on public domestic investment in Nigeria across three distinct periods: the pre-SAP era (1970–1985), the post-SAP era (1986–2022) and the pooled period (1970–2022). Over a span of 53 years, the analysis leverages key indicators, including total credit extended to the economy, total savings, the prime lending interest rate, and credit to the agricultural and manufacturing sectors. By comparing trends across the regulation and deregulation periods, the study provides a comprehensive assessment of the factors influencing public domestic investment in Nigeria.

2. Literature Review

This section examines relevant literature under the following categories: Literature Review, Theoretical Framework and Empirical Evidence.

2.1 Literature Review

Domestic investment refers to the expenditure on physical assets intended for the production of consumer and capital goods and services within a country rather than immediate consumption (Okosodo & Mamudu, 2018). It encompasses investments made within a nation's borders by its citizens, businesses, and government, involving the allocation of resources such as capital, labour and technology to create new assets, expand existing ones, or enhance infrastructure. Examples of domestic investment include:

a. Building or expanding factories.
b. Investing in research and development.
c. Constructing new roads, bridges, or public transport systems.
d. Developing real estate projects.
e. Funding education and training programs.
f. Establishing new businesses or upgrading existing ventures.
g. Investing in renewable energy projects and upgrading technology.

Mamudu (2021) emphasized that aggregate domestic investment in Nigeria comprises public and private domestic investments. Public domestic investment involves government expenditure on fixed or physical assets (e.g., buildings, machinery) to either replace or add to existing assets. Conversely, private domestic investment involves individuals' or firms' spending on similar assets for the same purposes. Domestic investment drives economic growth by creating jobs, improving productivity and efficiency, enhancing competitiveness, generating tax revenue, and boosting GDP, among other benefits.

Public capital investment, as described by Omodero (2020) includes government expenditure on infrastructure, capital projects, and major overhauls to meet citizens' needs. These expenditures, critical for sustainable development in developing nations, often focus on projects such as road construction, healthcare facilities, schools, energy generation and telecommunications.

Investment, in general, plays a pivotal role in economic growth, especially for Nigeria's economy. Osmond (2015) outlined two key types of domestic investment: public and private. Public investment addresses infrastructure and non-infrastructure needs, while private investment catalyses economic advancement. Additionally, investment can be categorized into individual, corporate, and government investments, each influenced by factors such as savings, income levels, taxation rates, interest rates, future expectations and political stability (Cole, 2017).

2.2 Theoretical Review

2.2.1 The Accelerator Theory of Investment

The accelerator principle, first comprehensively studied by Clark (1917) in his article Business Acceleration and the Law of Demand, posit that the demand for capital goods is directly linked to changes in the level of output. The extent of this change in demand is influenced by the capital-output ratio and fluctuations in output levels.

Since changes in aggregate output stem from fluctuations in aggregate expenditure or aggregate demand, equal to the change in equilibrium income, it follows that total investment in an economy at any given time is influenced by changes in aggregate demand. In equilibrium, this demand equals the increase in national income, plus replacement investment, which is often considered constant. This relationship is expressed quantitatively as:

$$I = V(Y_t - Y_{t-1}) + R \text{ or } I = VY + R. \quad (2.1)$$

Where: I = Gross Investment, V = Capital efficiency or capital-output ratio, Y_t = Income at the current time period t, Y_{t-1} = Income at the previous time period $_{t-1}$, and R = Replacement investment.

The strict accelerator model maintains a constant proportionality between capital and output, asserting that net induced investment $(I_{net})(I_{net})$ is solely determined by the rate of growth of the final product. This relationship is stated mathematically in equation (2.2).

$$(I_{net})t = V(Y_t - Y_{t-1}) \text{ or } (I_{net})t = V\Delta Y_t. \quad (2.2)$$

Here, net investment in a given period equals the product of the accelerator (V) and the change in aggregate output ($V\Delta Y_t V\Delta Y_t$) for that period. Importantly, if output stabilizes at a high level with no further growth, net investment becomes zero. Clark's focus on quantity rather than price connects this model to Keynesian principles, leading to its classification as an unyielding (or inflexible) accelerator model of investment (Akkina & Celebi, 2002).

Twine, Kiiza & Bashaasha (2015) extended the rigid accelerator model by underscoring its reliance on output growth under the condition that the desired capital stock is fully achieved within each time period. However, the rigid model fails to account for other determinants of investment, such as uncertainty (e.g., inflation), profitability, financial variables (for example credit availability, interest rates, deposits), and market imperfections. These limitations prompted the development of the flexible growth catalyst framework.

The flexible accelerator model of investment addresses these shortcomings by incorporating additional variables, such as volatility and market failure. This refinement is particularly relevant for analysing investment behaviour in developing economies (Dehn, 2000; Twine, Kiiza, & Bashaasha, 2015). Unlike the rigid model, the flexible accelerator recognizes that adjustments to the desired capital stock occur gradually rather than instantaneously. Jyotish (2015) proposed a net investment equation for the model that provides for dynamic adjustment, accounting for the time required to align actual and desired capital stocks:

$$I_t = \delta(Y_{t-1} - Y_{t-2}). \quad (2.3)$$

Where:
$I_t I_t$ = Net investment in the present time,
$Y_{t-1} Y_{t-1}$ = Desired capital stock in the previous period,
$Y_{t-2} Y_{t-2}$ = Actual capital stock in the period before last, and
δ = Partial adjustment coefficient.

Assumptions of the Acceleration Theory
The acceleration theory operates under the following assumptions:

a. The total capital stock of the economy is fully utilized; excess capacity invalidates the principle as additional output can be met with existing resources.
b. Firms promptly increase their capital stock to match rising demand for their products, regardless of the demand's nature.
c. The capital-output ratio remains fixed.
d. There is no upper limit to investment.
e. Growth in output rate directly triggers a corresponding increase in investment. Aggregate output growth does not alter the structural composition of the economy's output.

2.3 Empirical Review

Kolapo, Ojo and Olaniyan (2018) examined the relationship connecting deposit money banks' credit to the private and public sectors and economic development in Nigeria from 1970 to 2016. Using gross domestic product (GDP) per person as a proxy for economic development, the study identified credits to the private and public sectors, money supply, and lending interest rate as independent variables. The Ng-Perron and Augmented Dickey-Fuller Breakpoint Unit Root Tests were carried out to ascertain the order of stationarity. The Toda-Yamamoto (T-Y) direction of influence test revealed bidirectional causality between bank credit and economic development, suggesting mutual influence. The research suggested that monetary authorities regulate deposit money banks to foster private sector credit growth by addressing lending interest rates, given the private sector's critical role in driving economic development.

Chukwuma, Ifeanyi and Elo-Oghene (2018) utilized the autoregressive distributed lag (ARDL) model to assess the impact of public investment on real sector develop-

ment in Nigeria. Their findings revealed that public investment in economic, social, and community services directly influenced agricultural and industrial production in the short run, while investment in social infrastructure exert a more significant impact (0.027%) than economic services. Investments in education and healthcare were identified as key drivers of industrial and agricultural productivity, while public investment in economic services significantly boosted industrial output. The work concluded that gross capital expenditure positively impacts agricultural and manufacturing value-added, especially in the long run, and recommended enhanced social spending to boost human capital for real sector growth.

Agbarakwe (2019) analyzed the determinants of investment in Nigeria from 1980 to 2018 using multiple regression with ARDL methodology. The results showed that inflation, exchange rates, and interest rates negatively affected investment, while government expenditure positively influenced both short- and long-term investment. The study recommended stabilizing inflation, exchange rates, and interest rates while increasing infrastructure expenditure to create a favourable environment for private investment.

Effiom et al. (2020) investigated the effect of capital flight on domestic investment in Nigeria from 1980 to 2017 using ARDL techniques. The outcome of their work revealed a long-run relationship between domestic investment, capital flight, currency value, interest rates, inflation, total debt, GDP, and institutional quality. Capital flight had a negative impact on domestic investment, with long-run effects (0.57) being more severe than short-run effects (0.27). Poor institutional quality and unfavourable macroeconomic conditions, such as high exchange rates and inflation, discouraged investment. The study recommended improving institutional frameworks and developing the real sector to reduce capital flight and attract investment.

Yua, Yua, and Ogbonna (2021) assessed the effects of commercial banking credit on industrial output in Nigeria using time-series data from 1981 to 2018. Applying dynamic bound test and parsimonious regression, the study found that deposit money bank credit and money supply positively influenced industrial output, while inflation and lending rates had insignificant effects. The study recommended increasing budgetary allocations for infrastructure to reduce lending rates, improve credit access for manufacturers and boost industrial output.

Enya and Ezeali (2021) analysed the correlation between public infrastructure investment and economic growth in Nigeria using econometric techniques. Stationarity tests shows that all variables were integrated at first difference (I(1)). The co-integration test identified a long-run relationship among variables, with adjustment indicating an adjustment speed of -0.019307. Collective action for digital equity, education, and poverty reduction directly influenced economic growth, while transport investments had a negative impact. The analysis showed that public investment is crucial for economic growth, particularly in a democratic era.

Ajudua (2023) explored the influence of commercial banks' lending on Nigeria's economic growth using the error correction methodology. The investigation found a positive and significant relationship between total bank credit, money supply and economic growth. However, private sector credit had an insignificant positive effect,

while lending rates negatively influenced growth. The study recommended implementing policies to promote bank credit creation and improve private sector credit access to stimulate economic growth.

Muhammad and Ngele (2023) analysed the implications of commercial banks' lending on economic growth in Nigeria using ordinary least squares (OLS). Their findings showed that private sector credit, lending rates, and bank assets positively influenced GDP growth, except for lending rates, which had a negative effect. The study recommended channeling funds into productive sectors to enhance economic growth.

Lastly, Jolaiya (2024) examined the effect of increased financial access on domestic investment in Nigeria using ARDL techniques. The findings revealed that an increased in monetary aggregate, private sector credit, and market capitalization positively influenced domestic investment, while interest rates had a negative impact. The study suggested strategies to expand the monetary aggregate and private sector credit to meet the need for business investment funds.

3. Methodology

3.1 Theoretical Framework

After conducting a comprehensive review of the literature, particularly the accelerator principles of investment, an investment model is proposed to examine the nexus between commercial banks' credit and domestic investment in Nigeria. Historically, Keynesian economists have endorsed the accelerator model of investment, which emphasizes the impact of demand over factor costs. A generalized form of the accelerator principle is adaptable and flexible, which suggests that the organization's rate of asset formation is directly related to the gap between the existing capital stock and the desired capital stock. The model hypothesizes that firms aim to reduce a portion of this gap within each period, leading to the following net investment equation:

$$I_t = \delta (K^*_{t-1} - K_{t-2}) \tag{3.1}$$

Where: I_t = Net investment in the current period, K^*_{t-1} = Desired capital stock (one-period lag), K_{t-2} = Actual capital stock (two-period lag), δ = Partial adjustment coefficient. Within the flexible accelerator framework, determinants of K* may include output, internal funds, external financing costs, and socio-political and economic factors, collectively known as the investment climate. In Nigeria, investment is particularly constrained by inadequate infrastructure, notably energy and power supply. Consequently, the investment model for Nigeria incorporates macroeconomic variables reflective of these conditions.

3.2 Model Specifications

Variables included in the model are drawn from prior studies, including Igyo, Simon, and Iorlumun (2016). Their model is specified as:

$$INV = f(DMBC, LR) \quad (3.2)$$

From an operational perspective, equation (3.1) can be expressed as equation (3.3) as:

$$INV = \beta_0 + \beta_1 DMBC + \beta_2 LR + \mu \quad (3.3)$$

In this work: INV = Investment, DMBC = Total credit extended to the private sector by deposit money banks, LR = Deposit money banks' lending rate, β_0 = Intercept, β_1, β_2 = Coefficients of the independent variables and μ = Error term.

Additional variables identified in the literature, such as public domestic investment (PDI), total credit to the economy (TCE), financial assistance to the agricultural sector (TCA), credit to the manufacturing sector (TCM), total savings (TSV), and the official exchange rate (EXR), are included to refine the model.

Model I: Pre-SAP Period (1970–1985)

The functional form of the effect of DMBs credit on public domestic investment in Nigeria before SAP is presented as equations (3.4):

$$PDI_{t1} = f(TCE_t, TCA_t, TCM_t, TSV_t, PLR_t, EXR_{t,}) \quad (3.4)$$

The variables are as earlier defined and PLR_t = Prime Lending Interest Rate. Log-linear form is expressed in equation (3.5):

$$InPDI_{t1} = \beta_0 + \beta_1 InTCE_T + \beta_2 InTCA_t + \beta_3 TCM_t + \beta_4 InTSV_t + \beta_5 PLR_t + \beta_6 EXR_t + U_t \; \beta_1, \beta_2 \text{ and } \beta_4 > 0 \text{ while } \beta_{3,} \beta_5 \text{ and } \beta_6 < 0 \quad (3.5)$$

Where: $InPDI_t$ = Log of Public Domestic Investment, $InTCE_t$ = Log of Deposit Money Banks Total Credit Advanced to the Economy, $InTCA_t$ = Log of Deposit Money Banks Total Credit Advanced to Agricultural Sector, $InTCM_t$ = Log of Deposit Money Banks Total Credit Advanced to Manufacturing Sector, $lnTSV_t$ = Log of Total Savings with Deposit Money Banks, PLR_t = Prime Lending Interest Rate, EXR_t = Exchange Rate of Naira to US Dollar, U_t = Stochastic Term, β_0 = Intercept and $\beta_1 - \beta_6$ = Coefficients of the independent variables.

The error correction specification of equation (3.5) is presented as equation (3.6):

$$\Delta InPDI_t = \beta_0 + \beta_1 \Delta InTCE_t + \beta_2 \Delta InTCA_t + \beta_3 \Delta TCM_t + \beta_4 \Delta InTSV_t + \beta_5 \Delta PLR_t + \beta_6 \Delta EXR + \beta_7 ECM_{t-1} + U_t \quad (3.6)$$

Model II: Post-SAP Period (1986–2022)

The functional form of the model post SAP in equations (3.7):

$$PDI_{t2} = f(TCE_t, TCA_t, TCM_t, TSV_t, PLR_t, EXR_{t,}) \quad (3.7)$$

The log linear form is expressed in (3.8):

$$InPDI_{t2} = \beta_0 + \beta_1 InTCE_t + \beta_2 InTCA_t + \beta_3 TCM_t + \beta_4 InTSV_t + \beta_5 PLR_t + \beta_6 EXR_t + U_t \quad (3.8)$$

β_1, β_2 and $\beta_4 > 0$ while β_3, β_5 and $\beta_6 < 0$

The short-term adjustment specification is presented as equation (3.9):

$$\Delta InPDI_{t2} = \beta_0 + \beta_1 \Delta InTCE_t + \beta_2 \Delta InTCA_t + \beta_3 \Delta TCM_t + \beta_4 \Delta InTSV_t + \beta_5 \Delta PLR_t + \beta_6 \Delta EXR + \beta_7 ECM_{t-1} + U_t \quad (3.9)$$

Model III: Pooled Period (1970–2022)

The functional form of the pooled period estimation is presented in equations (3.10):

$$PDI_{t3} = f(TCE_t, TCA_t, TCM_t, TSV_t, PLR_t, EXR_{t,}) \quad (3.10)$$

The linear logarithmic form is expressed more specifically as equations (3.11):

$$InPDI_{t3} = \beta_0 + \beta_1 InTCE_t + \beta_2 InTCA_t + \beta_3 TCM_t + \beta_4 InTSV_t + \beta_5 PLR_t + \beta_6 EXR_t + U_t \quad (3.11)$$

β_1, β_2 and $\beta_4 > 0$ while β_3, β_5 and $\beta_6 < 0$

The error correction specification for the pooled period estimation is presented as equation (3.12):

$$\Delta InPDI_{t3} = \beta_0 + \beta_1 \Delta InTCE_t + \beta_2 \Delta InTCA_t + \beta_3 \Delta TCM_t + \beta_4 \Delta InTSV_t + \beta_5 \Delta PLR_t + \beta_6 \Delta EXR + \beta_7 ECM_{t-1} + U_t \quad (3.12)$$

Error Correction Models

Each log-linear equation is adjusted to include an adjustment parameter (ECM) to capture short-run dynamics and the speed of adjustment to long-run equilibrium.

3.3 Method of Data Analysis

The long-run models are evaluated using the Ordinary Least Squares (OLS) technique and the speed of adjustment to equilibrium is determined using the ECM coefficient. Structural breaks are identified using the Quandt-Andrews breakpoint technique to account for inconsistencies in regression results across periods (pre-SAP, post-SAP, and pooled).

4. Discussion of findings

Prior to ECM estimation, the level of stationarity was conducted on key variables (PDI, TCE, TCA, TCM, TSV, PLR, EXR) to ensure stationarity and prevent spurious results.

Table 1
The Augmented Dickey-Fuller and the Phillips-Perron Unit Root Test Results

Variable	ADF at Level	ADF at First Difference	PP at Level	PP at First Difference	Order of Integration
PDI	-0.935434 (0.7664)	-3.024320 (0.0306)	0.550162 (0.9868)	-3.553967 (0.0105)	I(1)
TCE	3.780652 (1.0000)	-4.176447 (0.0018)	3.859409 (1.0000)	-4.246284 (0.0015)	I(1)
TCA	5.284034 (1.0000)	3.620611 (0.0073)	15.54349 (1.0000)	-4.128673 (0.0021)	I(1)
TCM	0.937160 (0.9951)	4.791684 (0.0020)	14.20518 (1.0000)	-4.271234 (0.0014)	I(1)
TSV	2.801080 (1.0000)	5.187107 (0.0083)	1.782516 (0.996)	-5.550994 (0.0000)	I(1)
PLR	-1.753926 (0.3985)	-10.96267 (0.0000)	-2.243745 (0.1940)	-11.00898 (0.0000)	I(1)
EXR	2.951710 (1.0007)	-4.479265 (0.0007)	3.321827 (1.0000)	-4.501475 (0.0007)	I(1)
5%CV	-2.921175	-2.922449	-2.921175	-2.922449	

Source: Author's compilation with information from stationarity test results (2024).

The Augmented Dickey-Fuller and the Phillips-Perron test results which are displayed in Table 1 shows that all the selected variables (PDI, TCE, TCA, TCM, TSV, PLR and EXR) were stationary at first difference I(1).

4.1 Cointegration Test Results

Table 2 indicates the presence of at least four (4) cointegrating relationships.

Table 2
Unrestricted Cointegration Rank Test Results for the Pool Model on PDI

Hypothesised No. of CE(s)	Trace Stat.	Critical Value (0.05)	Prob**	Hypothesised No. of CE(s)	Max-Eigen Stat.	Critical Value (0.05)	Prob**
None*	395.5868	125.6154	0.0000	None*	229.4981	46.23142	0.0000
At most 1*	166.0887	95.75366	0.0000	At most 1*	66.71380	40.07757	0.0000
At most 2*	99.37493	69.81889	0.0000	At most 2*	44.37856	33.87687	0.0020
At most 3*	54.99637	47.85613	0.0092	At most 3*	38.78771	27.58434	0.0012
At most 4	16.20866	29.79707	0.6976	At most 4	9.848721	21.13162	0.7587
At most 5	6.359939	15.49471	0.6530	At most 5	4.846721	14.26460	0.7611
At most 6	1.513218	3.841466	0.2186	At most 6	1.513218	3.841466	0.2186

Source: Author's compilation with information from cointegration rank test results (2024).

The Trace and Max-Eigen statistics reject the null hypothesis in favour of the alternative at the 5% significance level indicating the existence of a unique long-run relationship between public domestic investment, total credit advanced to the financial framework by deposit money banks (DMBS), total credit advanced to the agricultural sector by DMBS, total credit advanced to the manufacturing sector by commercial banks, total savings with DMBS, the prime lending interest rate, lastly, exchange rate of the Naira to the US Dollar.

4.2 Error Correction Representation (Short-Run) Results

The results of the error adjustment parameter for pre-SAP (1970-1985), post-SAP (1986-2022) and Pooled data estimations (1970-2022) are reported in the below:

Table 3
Error Correction Coefficient (Short Run) Results for the Models

Dependent Variable: InPDI1				Dependent Variable: InPDI2			Dependent Variable: InPDI3		
Regressor	Coeff.	t-Stat.	Prob.	Coeff.	t-Stat.	Prob.	Coeff.	t-Stat.	Prob.
C	0.503455	1.515230	0.1735	1.039384	1.323699	0.1971	185.4660	0.925275	0.3601
D(InTCE)	0.652753	4.991115	0.0000	0.652727	3.356561	0.0057	1.257885	7.710652	0.0000
D(InTCA)	0.440220	3.535080	0.0043	0.537060	0.544572	0.5719	0.680931	2.930223	0.0283
D(InTCM)	0.250186	2.365445	0.0429	0.293957	2.755993	0.0356	0.858376	3.354027	0.0079
D(InTSV)	0.715943	4.361915	0.0002	0.701780	5.834844	0.0000	1.490410	7.673704	0.0000
D(PLR)	-0.183275	-0.359627	0.6667	-27.02131	-0.372558	0.3295	-45.77351	-1.403011	0.1767
D(EXR)	-0.390471	-3.688490	0.0036	-46.70523	-3.781197	0.0041	-39.11974	-1.463491	0.1508
ECM(-1)	-0.542794	-3.867845	0.0028	-0.902596	-6.368419	0.0000	-0.940916	-8.823965	0.0000

Source: Author's compilation with information from Regression Output (2024).
Note: PDI_1 = Public domestic investment in Nigeria before the economic restructuring programme;
PDI_2 = Public domestic investment in Nigeria after the structural adjustment programme;
PDI_3 = Public domestic investment in Nigeria for the pooled data estimation.

The findings indicate that all explanatory variables in the pre-SAP, post-SAP and pooled data estimations align with their expected signs across the three models. The results show that aggregate credit advanced to the economy by deposit money banks (DMBS) had a direct and significant impact on public domestic investment (PDI1, PDI2 and PDI3) during the study periods. Specifically, a 1% increase in total credit advanced to the economy by DMBS led to approximately 65.3%, 65.3% and 125.8% increases in public domestic investment in the pre-SAP, post-SAP and pooled data periods, respectively. This supports the notion that bank credit facilitates investment growth and aligns with previous research findings (Baghebo & Edumiekumo, 2012; Okaro, 2016).

The analysis further indicated that total credit advanced to the agricultural sector (TCA) by commercial banks also had a positive and significant effect on public domestic investment (PDI1, PDI2 and PDI3). A 1% increase in TCA resulted in a 44.0%,

53.7% and 68.1% rise in public domestic investment during the pre-SAP, post-SAP, and pooled periods, respectively. This underscores the importance of sustained credit supply to the agricultural sector for boosting domestic investment and fostering sustainable growth, consistent with prior studies (Ekine & Onukwuru, 2018; Aigbomian & Mamudu, 2020).

Similarly, total credit advanced to the manufacturing sector (TCM) by DMBs had a significant and direct effect on public domestic investment. A 1% increase in TCM raised public domestic investment by 27.1%, 29.4% and 85.8% during the pre-SAP, post-SAP and pooled periods, respectively. These findings highlight the role of manufacturing sector credit in enhancing domestic investment and economic development, corroborating earlier studies (Nnanna, 2004; Aliyu & Yusuf, 2013; Aigbomian & Mamudu, 2020).

Total savings with deposit money banks (TSV) contributed positively to public domestic investment in all three models. A 1% change in TSV led to increases of 71.6%, 70.2% and 149.0% in public domestic investment during the pre-SAP, post-SAP and pooled periods, respectively. This aligns with studies by Orji (2012) and Nnachi and Nnamani (2017), which emphasized the vital importance of savings in stimulating domestic investment and economic expansion.

The findings also indicated that prime lending interest rate (PLR) had a negative relationship with public domestic investment across all models. A 1% change in PLR decreased public domestic investment by 0.18%, 27.02% and 45.77% in the pre-SAP, post-SAP and pooled periods, respectively. This suggests that high lending rates discourage investment, reinforcing the importance of maintaining favorable interest rates to stimulate economic growth, as highlighted in prior studies (Davis & Emerenini, 2015).

Furthermore, the official exchange rate (EXR) exhibited an inverse relationship with public domestic investment. A 1% increase in EXR (depreciation of the Naira) reduced public domestic investment by 0.39%, 46.71% and 39.12% during the pre-SAP, post-SAP and pooled periods, respectively. These results imply that exchange rate fluctuations influence domestic investment, aligning with the findings of Anthony, Uzomba and Olatunji (2012).

Lastly, the speed of adjustment coefficients of -0.542794, -0.902596 and -0.940916 for the pre-SAP, post-SAP and pooled periods, respectively, were statistically significant and had the expected signs. These values suggest a rapid convergence to long-run equilibrium, with rates of 54.3%, 90.3% and 94.1%, respectively, whenever short-run disequilibrium occurs.

4.3 Diagnostic Test Results

To verify the reliability of the public domestic investment models in Nigeria across the pre-SAP, post-SAP and pooled data estimation periods, diagnostic tests were conducted. The outcome of these diagnostic tests are reported in the below:

Table 4
Diagnostic Statistics Results for the Models

	InPDI1	InPDI2	InPDI3		InPDI1	InPDI2	InPDI3
R-squared	0.720908	0.919867	0.938432	Mean dependent var	0.990000	1853.280	1261.916
Adjusted R-squared	0.671617	0.898293	0.928171	S.D. dependent var	2.835124	1990.508	1851.128
S.E. of regression	0.384399	634.8026	496.1187	Akaike info criterion	4.230258	15.94683	15.39715
Sum squared resid	1.034341	10.477334	10.33762	Schwarz criterion	4.607884	16.30597	15.70308
Log likelihood	-15.26933	-263.0961	-376.9289	Hannan-Quinn criter	4.226235	16.06931	15.51365
F-statistic	107.7949	42.63750	91.45399	Durbin-Watson stat	2.217571	1.744564	1.731132
Prob (F-statistics)	0.000001	0.000000	0.000000				

Source: Author's compilation with information from Regression Output (2024).

The coefficient of determination (R^2) values of 72.1%, 92.0% and 93.8% for the three models indicate that the total variation in public domestic investment in Nigeria before SAP, after SAP, and during the pooled data estimation periods is largely explained by factors such as total credit advanced to the economy by DMBS, credit extended to the agricultural and manufacturing sectors by DMBS, total savings with DMBS, prime lending interest rate, and the official exchange rate of Naira to US Dollar. The Akaike Information Criterion, Schwarz Criterion, and Hannan-Quinn Criterion confirm that the three models were correctly specified. Additionally, the F-statistics, which assess the joint significance of all regressors, were statistically significant at the 5% level for all models. The Durbin-Watson statistics of 2.217571, 1.744564 and 1.731132 for the three models suggest that autocorrelation issues have been addressed.

4.4 Structural Breakpoint Test

To identify the structural break year within the study periods, the Quandt-Andrews Structural Breakpoint test was utilized, and the outcome are reported in the table hereunder:

Table 5
Quandt-Andrews Structural Breakpoint Test Results for pooled PDI_3 Model

Statistic	Value	Prob.
Maximum LR F-statistic (2007)	89.11912	0.0000
Maximum Wald F-statistic (2007)	623.8338	0.0000
Exp LR F-statistic	40.97604	0.0000
Exp Wald F-statistic	308.3334	0.0000
Ave LR F-statistic	7.655308	0.0000
Ave Wald F-statistic	53.58715	0.0000

Source: Author's compilation with information from Quandt-Andrews breakpoint test (2024).

The Quandt-Andrews structural breakpoint test results for the varying regressors (TCE, TCA, TCM, TSV, PLR, EXR) with 33 breaks, based on 15 percent trimmed data, revealed that both the maximum LR and Wald F-statistics indicated 2007 as the structural break year for the estimated pooled period. The results, as shown in Table 5 demonstrated that both the maximum LR and Wald F-statistics values of 10.2268 and 71.5875, with p-values of 0.0000, are statistically significant at the 5% level. Additionally, the Exp LR, Exp Wald, Ave LR, and Ave Wald F-statistics values of 2.9498, 32.4957, 2.3268, and 16.2878 respectively are also statistically significant at the 5% level. This suggests that 2007 is the actual structural break year for the period under review, aligning with the findings of previous studies (Doguwa, Olowofeso, Uyaebo, Adamu & Bada, 2014).

4.5 Policy Implications of Results

The findings of the study suggest the following policy implications:

a) Total credit advanced to the economy (TCE), the agricultural sector (TCA) and the manufacturing sector (TCM) had a direct and significant impact on public domestic investment (PDI) in Nigeria during the pre-SAP, post-SAP and pooled estimation periods. This indicates that a 1% increase in credit to the economy, agricultural and manufacturing sectors boosts public domestic investment in Nigeria during these periods.

b) Total savings with commercial banks (TSV) also had a significant positive effect on public domestic investment in Nigeria during the pre-SAP, post-SAP and pooled estimation periods, meaning that a 1% increase in savings raised public domestic investment significantly.

c) Prime lending interest rate (PLR) and exchange rate (EXR) both had an inverse relationship with public domestic investment in Nigeria during the study periods, indicating that high interest rates and an unfavorable exchange rate discourage public domestic investment.

d) The Error Correction Mechanism (ECM) in all the estimation periods was correctly signed and statistically significant at the 5% level. The coefficient values of ECM for the pre-SAP, post-SAP and pooled periods (-0.542794, -0.902596 and -0.940916, respectively) suggest a high speed of adjustment of 54.3%, 90.3% and 94.0%, respectively.

e) Outcome of Quandt-Andrews breakpoint test revealed that the structural break year for the periods under review was 2007, marking the beginning of the financial downturn that affected Nigeria, characterized by high lending interest rates and exchange rates.

5. Conclusion

Domestic investment has played an important factor in the growth and development of both developed and emerging economies. To tap into this potential, The Nigerian Nation has initiated a range of investment policies and strategies, including the Structural Adjustment Programme, financial sector restructuring and bank consolidation, aimed at boosting public domestic investment. The study's analysis of pre-SAP, post-SAP and pooled data revealed that total credit advanced to the economy, the agricultur-

al and industrial sectors, and total savings all had a direct and significant impact on public domestic investment in Nigeria, while prime lending interest rate (PLR) and exchange rate (EXR) had a negative impact. The Quandt-Andrews structural breakpoint test indicated that 2007 was the actual break year due to the onset of the global financial crisis.

5.1 Recommendations

a) Monetary authorities should reduce interest rates to single-digit levels to reverse their negative impact on investment. This would also support financial sector development, particularly in terms of granting credits in the economy, foster a favorable environment for public investors to borrow and invest domestically.

b) CBN should encourage deposit money banks to expand their presence in rural areas to promote savings, which will significantly influence total savings in the economy.

c) Governments at all levels (federal, state and local) should allocate at least 60% of total expenditure to capital and infrastructural projects to significantly boost public domestic investment.

d) The Central Bank of Nigeria should manage prime lending interest rates and exchange rates effectively as instruments of monetary policy to maintain stable public domestic investment and avoid undesirable structural breaks in the economy in the future.

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