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IMPACT OF HOUSEHOLD CONSUMPTION EXPENDITURE ON PRIVATE INVESTMENT IN NIGERIA

ABSTRACT

This study examined the impact of household consumption expenditure on private investment in Nigeria over the period 1990 to 2024. Specifically, the study investigated the effects of household expenditure on housing and household expenditure on electricity on private investment, while interest rate was included as a control variable. The study was motivated by the persistent decline and instability in private investment despite rising household consumption expenditure in Nigeria. Annual time-series data were sourced from the Central Bank of Nigeria Statistical Bulletin, World Development Indicators, and National Bureau of Statistics. The study adopted the Error Correction Model (ECM) estimation technique following the confirmation of mixed integration orders among the variables through the Augmented Dickey-Fuller (ADF) unit root test and the existence of long-run relationship using the ARDL Bounds test approach. The empirical findings revealed that household electricity expenditure exerts a negative effect on private investment in Nigeria. Specifically, the lagged electricity expenditure variable was found to be statistically significant and negatively related to private investment, implying that rising electricity costs crowd out productive investment activities. The result further showed that previous private investment positively influences current investment performance, indicating investment persistence over time. The error correction term was negative and statistically significant, confirming the existence of long-run equilibrium relationship among the variables and indicating that approximately 9.1% of short-run disequilibrium is corrected annually. The study concludes that excessive household expenditure on essential utilities, particularly electricity, weakens investment capacity in Nigeria. The study therefore recommends improved electricity infrastructure, affordable housing policies, and investment-friendly macroeconomic policies to stimulate sustainable private investment growth.

Keywords: *Household Consumption Expenditure, Private Investment, Housing Expenditure, Electricity Expenditure, Error Correction Model, Nigeria.*

JEL Codes: *E21, E22, C32, O55.*

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1. Introduction

Household consumption expenditure is a major component of aggregate demand and plays a central role in determining macroeconomic performance. Globally, household consumption accounts for about 55%–70% of GDP in advanced economies such as the United States, United Kingdom, and other OECD countries, making it a key driver of private investment through demand stimulation and profitability incentives (World Bank, 2024; Keynes, 1936). In economic theory, especially the Keynesian framework, rising consumption is expected to encourage firms to expand productive capacity, thereby increasing private investment.

In developing regions, particularly Africa, household consumption has continued to rise due to population growth, urbanization, and expanding informal income activities. Africa's population surpassed 1.4 billion in 2024 (United Nations, 2024), and consumption expenditure now constitutes a significant share of economic activity across many economies. However, unlike advanced economies, the consumption-investment transmission mechanism in Africa is weak due to structural bottlenecks such as inadequate infrastructure, low savings rate, inflationary pressure, and high dependency on imported consumption goods (Iyoha, 2021; Todaro & Smith, 2020).

In Nigeria, household consumption expenditure accounts for over 60%–65% of GDP, making it the largest component of aggregate demand (Central Bank of Nigeria, 2023; Enwefah & Maku, 2024). Despite this, private investment remains relatively low and volatile. Nigeria faces persistent structural challenges, particularly in housing and electricity. The housing deficit is estimated at over 17 million units (Federal Ministry of Works and Housing, 2023), while electricity supply remains unstable with average generation far below national demand (NERC, 2024). Electricity consumption constraints significantly affect productivity and investment decisions in Nigeria (Onisanwa & Adaji, 2020; Olaniyan et al., 2018).

Household welfare and consumption expenditure have been found to positively influence electricity consumption patterns in both the short and long run (Wokoma et al., 2021). Similarly, Babatunde and Enehe (2011) established that electricity consumption in Nigeria is strongly influenced by household income and socio-economic variables, highlighting the central role of household expenditure behaviour in energy demand dynamics.

In an ideal economic setting, rising household consumption expenditure should stimulate private investment by increasing demand for goods and services, thereby encouraging firms to expand production capacity. This aligns with Keynesian and accelerator models of investment, which suggest that consumption-driven demand expansion leads to higher capital formation (Keynes, 1936; Jorgenson, 1963).

However, in Nigeria, this theoretical expectation appears inconsistent with reality. Although household consumption continues to rise steadily, private investment remains weak and unstable. For example, despite consumption accounting for over 60% of GDP, gross fixed capital formation remains relatively low compared to emerging economies with similar consumption levels (World Bank, 2024). Electricity shortages alone impose large economic losses estimated in billions of dollars annually, reducing industrial output and discouraging private investment (World Bank,

2023). Similarly, high housing costs reduce disposable income available for savings and productive investment.

The Nigerian government has implemented several policy interventions aimed at addressing these challenges. These include power sector privatization, rural electrification programs, housing finance schemes, and investment promotion incentives. Despite these interventions, electricity supply remains unreliable, housing deficits continue to widen, and private investment growth remains insufficient to meet development needs (NERC, 2024; Federal Ministry of Works and Housing, 2023).

Empirical literature on Nigeria has largely focused on macroeconomic determinants of private investment such as interest rates, inflation, exchange rates, and government expenditure (Iyoha, 2021; Odedokun, 2022). Although some studies have examined electricity consumption and private investment (Omojolaibi et al., 2016), and government expenditure and private consumption (Ajayi & Oluwagbemi, 2024), very few studies have disaggregated household consumption into specific components such as housing and electricity to examine their direct impact on private investment. This constitutes a major gap in the literature. Therefore, this study is important at this time because Nigeria is currently experiencing rising inflation, energy insecurity, housing shortages, and increasing household consumption pressures. Understanding how specific consumption components affect private investment is critical for policy formulation aimed at stimulating sustainable economic growth.

The main objective of this study is to examine the impact of household consumption expenditure on private investment in Nigeria. The specific objectives are to:

i. Examine the impact of household expenditure on housing on private investment in Nigeria.
ii. Assess the impact of household expenditure on electricity on private investment in Nigeria.

This study is significant in several ways. It contributes to the literature by disaggregating household consumption into housing and electricity components, thereby providing a more detailed understanding of consumption-investment linkages. Second, it provides empirical evidence that can guide policymakers in designing sector-specific interventions that promote investment-friendly consumption patterns.

For policymakers, the study offers insights into how energy and housing policies affect investment outcomes. For investors, it highlights demand-side constraints that influence profitability and business expansion. For academia, it extends existing literature by integrating household consumption structure into private investment analysis in a developing economy context (Onisanwa & Adaji, 2020; Babatunde & Enehe, 2011).

The study focuses on Nigeria and examines the relationship between household consumption expenditure and private investment from 1990 to 2024. It specifically considers two key components of household consumption: housing expenditure and electricity expenditure. The analysis is based on time-series macroeconomic data covering several decades to capture both short-run and long-run dynamics.

The study is organized into five sections. The first covers the introduction, including background, statement of the problem, objectives, significance, scope, and organization of the study. The second section reviews relevant theoretical and empirical literature. The third the methodology, including model specification and estimation techniques. The fourth section data analysis and discussion of findings. Chapter Five provides the summary, conclusion, and policy recommendations.

2. Literature Review

Theoretical Literature

The relationship between household consumption expenditure and private investment has been explained through several competing theoretical frameworks, each offering different transmission mechanisms. The Keynesian consumption theory provides one of the earliest foundations for this relationship. According to Keynes (1936), consumption is a primary driver of aggregate demand, and increases in household spending can stimulate business revenues, thereby encouraging firms to expand production and invest in capital formation. However, Keynes also cautioned that excessive consumption relative to income could reduce savings, thereby limiting funds available for investment in the long run.

The life-cycle hypothesis further extends this argument by explaining how households allocate income between consumption and savings over time (Modigliani & Brumberg, 1954). According to this theory, households smooth consumption across their lifetime, implying that higher current consumption may reduce savings and, consequently, lower the pool of loanable funds available for private investment. In economies like Nigeria where financial intermediation is weak, this reduction in savings can significantly constrain investment growth.

The accelerator theory of investment provides a demand-driven explanation, suggesting that investment is positively related to changes in consumption and output (Jorgenson, 1963). When household consumption increases, firms respond by increasing investment in capital stock to meet rising demand. This implies a positive relationship between consumption expenditure and private investment, particularly in sectors producing consumer goods and services.

In contrast, the crowding-out hypothesis suggests that rising consumption, especially when driven by imported goods or non-productive expenditures such as housing and energy costs, may reduce domestic savings and limit funds available for private investment (Friedman, 1957). In developing economies, high consumption of basic necessities may not translate into productive investment demand if the consumption is not linked to domestic production capacity.

The dual-sector development theory also provides useful insight, particularly for developing economies. It argues that structural imbalances between consumption-driven traditional sectors and investment-driven modern sectors can distort resource allocation (Lewis, 1954). In this context, excessive household expenditure on non-productive sectors such as housing rent and electricity consumption may divert resources away from productive investment activities. These theories suggest that the impact of household consumption expenditure on private investment is ambiguous

and depends on the structure of consumption, savings behaviour, and the efficiency of financial intermediation.

2.2 Empirical Literature

Empirical studies on the relationship between household consumption expenditure and private investment have produced mixed results. Several studies report a positive relationship, suggesting that increased consumption stimulates demand and encourages private sector investment. Ogundipe and Alege (2018) found that consumption expenditure in Nigeria has a significant positive effect on private investment through demand expansion channels. Similarly, Nwosa (2020) observed that rising household consumption contributes to increased industrial output and investment in manufacturing sectors.

In contrast, other studies report a negative relationship between consumption and investment, particularly in developing economies where consumption is skewed toward non-productive goods. Eze and Okpala (2019) found that high household consumption in Nigeria reduces domestic savings, thereby constraining private investment. Likewise, Adegboye and Alabi (2021) argue that excessive consumption expenditure, especially in urban areas, limits capital accumulation and reduces investment growth.

Housing expenditure represents a significant component of household consumption, particularly in urban economies. Housing costs can influence investment through both income and savings channels. In Nigeria, high housing rents and property prices have been shown to reduce disposable income available for savings and investment (Akeju & Olanipekun, 2015).

Olatunji et al. (2019) found that rising housing expenditure negatively affects household savings behaviour, thereby limiting private capital formation. In contrast, some studies argue that housing development can stimulate investment through construction sector linkages. Adebayo and Ojo (2020) found that housing-related expenditure contributes positively to investment in construction and real estate sectors in Nigeria.

Electricity expenditure is another critical component of household consumption with strong implications for investment behaviour. In Nigeria, persistent electricity shortages have forced households and firms to rely on alternative energy sources such as generators, increasing consumption expenditure without necessarily improving productive efficiency.

Akinlo (2009) found that unreliable electricity supply reduces manufacturing output and discourages private investment in Nigeria. Similarly, Adenikinju (2005) observed that poor electricity infrastructure significantly increases production costs, thereby reducing investment incentives. Onisanwa and Adaji (2020) and Wokoma et al. (2021) confirm that household electricity expenditure in Nigeria is largely inefficient and consumption-driven rather than productivity-enhancing. These studies suggest that high electricity costs, combined with unreliable supply, reduce the ability of households to save and invest.

Research Gap

Most prior research has focused on macroeconomic variables such as interest rates, inflation, exchange rates, and public expenditure, while treating household consumption as a broad aggregate variable. This aggregation conceals important structural differences within consumption patterns, particularly between essential expenditure components such as housing and electricity, which may exert different and even opposing effects on private investment. As a result, the specific transmission channels through which household consumption influences investment behavior remain insufficiently understood.

A significant methodological gap exists in the literature. Many existing studies rely on static estimation techniques such as Ordinary Least Squares (OLS) or simple cointegration frameworks that do not adequately capture both short-run dynamics and long-run equilibrium adjustments among variables. Given the time-series nature of macroeconomic variables like consumption and investment, ignoring dynamic adjustment processes may lead to biased or incomplete results. In particular, very few studies have applied the Error Correction Model (ECM) framework in analyzing disaggregated household consumption effects in Nigeria. The ECM is essential in this context because it allows for the simultaneous estimation of long-run relationships and short-run adjustments, while also capturing the speed at which deviations from equilibrium are corrected. This study therefore fills this gap by applying the ECM approach to provide a more robust and dynamic analysis of the consumption investment relationship in Nigeria.

3. Methodology

Theoretical framework

This study is anchored on the Keynesian Consumption–Saving–Investment Theory, which emphasizes that household consumption behavior plays a central role in determining both savings and private investment in an economy. Keynes argued that as income increases, consumption also rises, but not by the same proportion. The portion of income that is not consumed becomes savings, and these savings when channeled through the financial system form the basis for private investment. Thus, the Keynesian model provides a clear theoretical foundation for understanding how changes in household spending patterns can either stimulate or constrain private investment in Nigeria's economy (Blanchard & Johnson, 2022). The framework is expressed as:

$$C + I = a + \frac{bY}{1+cY} + dMPC \square \Delta Y + \frac{eI_0}{1+fY} \quad \text{.....(1)}$$

Where C = Total consumption expenditure; I = Private investment; a = Autonomous consumption; b = Base marginal propensity to consume; Y = Disposable income; c = Adjustment factor reflecting income saturation in consumption; d = Scaling factor for the marginal change in consumption; MPC· ΔY = Incremental consumption change due to income variation; e = Autonomous investment coefficient; I_0 = Base level of investment independent of income; f = Adjustment factor reflecting diminishing investment responsiveness to income

This equation captures the dual effect: consumption is a function of current and marginal income, and investment responds both to a base level (I_0) and to income saturation effects, reflecting the Keynesian link between savings, consumption, and investment.

Empirical model specification

This study adapts the general framework of Olalere & Aladetanye (2025), which typically models real GDP as a function of household consumption, investment, and government spending. For the purpose of this study, the focus is narrowed to private investment (INV) as the dependent variable, while household expenditure components are treated as the main explanatory variables (household expenditure on housing, and household expenditure on electricity), and interest rate as the control variable. The model is therefore specified as:

$$INV_t = f(HHOUS, HELEC, INT) \quad \textbf{(2)}$$

Econometrically, the model is specified thus:

$$INV_t = \alpha_0 + \alpha_1 HHOUS_1 + \alpha_2 HELEC_2 + \alpha_3 INT_3 + \mu_t \quad \textbf{(3)}$$

Making it a logarithmic function, we have:

$$logINV_t = \alpha_0 + \alpha_1 logHHOUS_1 + \alpha_2 logHELEC_2 + \alpha_3 INT_3 + \mu_t \quad \textbf{(4)}$$

Accordingly, the ECM model is given as:

$$\Delta \mathrm{INV}_t = \alpha_0 + \sum_{i=1}^{p} \alpha_1 \Delta \mathrm{INV}_{t-i} + \sum_{i=0}^{p} \alpha_2 \Delta \mathrm{HHOUS}_{t-i} + \sum_{i=0}^{p} \alpha_3 \Delta \mathrm{HELEC}_{t-i} + \sum_{i=0}^{p} \alpha_4 \Delta \mathrm{INT}_{t-i} + \lambda(\mathrm{INV}_{t-1} - \beta_0 - \beta_1 \mathrm{HHOUS}_{t-1} - \beta_2 \mathrm{HELEC}_{t-1} - \beta_3 \mathrm{INT}_{t-1}) + \varepsilon_t \quad \textbf{(5)}$$

Estimation method: Error correction model (ECM)

This study employs the Error Correction Model (ECM) as its primary estimation technique to examine the relationship between household consumption expenditure and private investment in Nigeria. The choice of ECM is informed by the time-series nature of the variables involved and the likelihood that they are integrated of order one, I(1), but cointegrated in the long run. According to Engle and Granger (1987), when a long-run equilibrium relationship exists among non-stationary variables, ECM becomes the appropriate framework because it combines both short-run dynamics and long-run equilibrium adjustments within a unified specification. This makes it particularly suitable for macroeconomic studies involving investment behaviour, consumption patterns, and interest rate dynamics.

The ECM is also preferred because it corrects for short-run disequilibrium while ensuring convergence toward long-run equilibrium. In economies like Nigeria, where structural shocks such as inflationary pressures, electricity shortages, and housing deficits frequently disrupt macroeconomic stability, variables often deviate from their long-run paths. The ECM captures this adjustment process through the error correction term (ECT), which measures the speed at which deviations from long-run equilibrium are corrected over time. A significant and negative coefficient of the ECT confirms the existence of long-run causality and stability in the system (Gujarati & Porter, 2009; Pesaran et al., 2001).

In line with this framework, the ECM allows the study to separately estimate both short-run and long-run effects of household expenditure on housing, electricity, and interest rate on private investment. This is particularly important because economic agents often respond differently to short-run fluctuations compared to long-run structural changes. For instance, short-term increases in electricity expenditure may reduce disposable income immediately, while long-term effects may reflect deeper structural inefficiencies in energy supply affecting investment decisions (Akinlo, 2009; Onisanwa & Adaji, 2020). To guide the empirical estimation, the following hypotheses are formulated in mathematical form based on the ECM specification:

Long-run Hypotheses

$$H_0: \beta_1 = \beta_2 = \beta_3$$

(There is no long-run relationship between household consumption expenditure housing, electricity, interest rate and private investment in Nigeria)

$$H_1: \beta_1 \neq 0 \text{ or } \beta_2 \neq 0 \text{ or } \beta_3 \neq 0$$

(There exists a significant long-run relationship between household consumption expenditure variables and private investment)

Short-run Hypotheses

$$H_0: \alpha_2 = \alpha_3 = \alpha_4$$

(Household consumption expenditure on housing, electricity, and interest rate have no short-run effect on private investment)

$H_1: \alpha_2 \neq 0$ *or* $\alpha_3 \neq 0$ or $\alpha_4 \neq 0$

(At least one of the short-run coefficients significantly affects private investment)

Accordingly, the Error Correction Term (Adjustment Hypothesis) is given as:

$$H_0::\lambda = 0$$

(No adjustment toward long-run equilibrium; no cointegration exists)

$$H_0::\lambda < 0$$

(There is a valid long-run equilibrium relationship and deviations are corrected over time)

Diagnostic and Pre-Estimation Tests

Prior to estimating the Error Correction Model (ECM), several diagnostic and pre-estimation tests are conducted to ensure the validity, reliability, and robustness of the empirical results for the study on the impact of household consumption expenditure on private investment in Nigeria. The

unit root test is carried out using the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests to determine the stationarity properties of the variables. This step is necessary because time series variables such as private investment (INV), household expenditure on housing (HHOUSE), household expenditure on electricity (HELEC), and interest rate (INT) are often non-stationary at levels but become stationary after first differencing. The presence of a mixed order of integration, I(0) and I(1), justifies the use of the ARDL–ECM framework, as established by Pesaran et al. (2001).

The ARDL bounds testing approach to cointegration is employed to determine the existence of a long-run relationship among the variables. The bounds test compares the computed F-statistic with the critical values provided by Pesaran, Shin, and Smith (2001). If the F-statistic exceeds the upper bound critical value, the null hypothesis of no long-run relationship is rejected, confirming that private investment, household expenditure on housing, household electricity expenditure, and interest rate are cointegrated. This provides the theoretical justification for estimating both long-run and short-run dynamics within the ECM framework. Diagnostic tests for serial correlation and heteroskedasticity are conducted using the Breusch-Godfrey LM test and the Breusch-Pagan-Godfrey test respectively. These tests ensure that the residuals of the model are well-behaved and that the estimated coefficients are efficient and unbiased. In addition, the normality test (Jarque-Bera test) is used to confirm that the error terms are normally distributed, which is important for valid statistical inference.

The stability of the model is examined using the Cumulative Sum (CUSUM) and Cumulative Sum of Squares (CUSUMSQ) tests. These tests help to determine whether the estimated parameters remain stable over the sample period or whether structural breaks exist due to macroeconomic shocks such as inflation, electricity crises, and housing market fluctuations in Nigeria. A stable model ensures that the estimated relationships between household consumption components and private investment are reliable over time.

Data and Variable Measurement

This study uses annual time-series data for Nigeria covering the period 1990 to 2025. The dependent variable, private investment (INV), is measured by gross fixed capital formation as a percentage of GDP. This variable reflects the level of capital accumulation in the economy and serves as a proxy for private sector investment performance. The data is sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin and the World Bank Development Indicators (World Bank, 2025).

The main explanatory variables include household consumption expenditure components. Household expenditure on housing (HHOUSE) captures spending on rent, housing maintenance, and related accommodation costs. This variable reflects the burden of housing consumption on household income and its potential effect on savings and investment behaviour. Household expenditure on electricity (HELEC) measures household spending on electricity consumption, including grid electricity payments and alternative energy sources such as generators, reflecting the energy cost burden on households in Nigeria.

The study also includes a control variable, interest rate (INT), measured by the monetary policy rate or lending interest rate obtained from the Central Bank of Nigeria (CBN, 2025). This variable captures the cost of borrowing and monetary policy stance, which are critical determinants of private investment decisions in macroeconomic theory.

The selection of these variables is grounded in both theoretical and empirical literature. Keynesian and accelerator theories suggest that consumption influences investment through demand effects, while neoclassical investment theory emphasizes the role of interest rates in determining the cost of capital.

4. Results and Discussions of findings

Table 1 Descriptive Statistics of the Variables

Statistics	INV	HHOUS	HELEC	INT
Mean	19.57500	7.006818	2.836364	-0.181036
Median	19.10000	7.400000	3.000000	2.621683
Maximum	27.00000	10.30000	4.200000	18.18000
Minimum	12.90000	1.300000	0.500000	-65.85715
Std. Dev.	4.292835	2.293002	0.936865	14.29658
Skewness	0.098976	-0.652774	-0.642812	-2.517420
Kurtosis	1.641521	2.858871	2.880778	11.66986
Jarque-Bera	3.455193	3.161350	3.056242	184.2796
Probability	0.177711	0.205836	0.216943	0.052162
Sum	861.3000	308.3000	124.8000	-7.965581
Sum Sq. Dev.	792.4225	226.0880	37.74182	8788.863
Observations	44	44	44	44

Source: *Author's Computation (2026)*

The descriptive statistics in Table 1 descriptive statistics provide preliminary insights into the distributional properties, central tendencies, and variability of the variables. The result shows that private investment (INV) recorded an average value of 19.58, indicating a relatively moderate level of private sector capital formation in Nigeria during the study period. The maximum and minimum values of 27.00 and 12.90 respectively suggest that private investment fluctuated considerably across the years. The standard deviation of 4.29 indicates moderate variability around the mean. The skewness value of 0.10 implies that the distribution of private investment is approximately symmetric with a slight positive skewness. Furthermore, the kurtosis value of 1.64 indicates a platykurtic distribution, suggesting that the series is less peaked than a normal

distribution. The Jarque-Bera probability value of 0.178, which is greater than 0.05, indicates that the null hypothesis of normal distribution cannot be rejected.

For household expenditure on housing (HHOUS), the mean value stood at 7.01, with a maximum of 10.30 and minimum of 1.30, indicating substantial differences in housing expenditure over time. The standard deviation of 2.29 suggests moderate dispersion from the mean. The skewness coefficient of -0.65 indicates a negatively skewed distribution, implying that the series has more observations clustered toward higher values. The kurtosis value of 2.86 is close to the benchmark value of 3, suggesting near-normal distribution. Similarly, the Jarque-Bera probability value of 0.206 confirms that the variable is normally distributed.

Household expenditure on electricity (HELEC) recorded an average value of 2.84, with values ranging from 0.50 to 4.20. The relatively low standard deviation of 0.94 indicates that electricity expenditure did not fluctuate widely over the study period. The variable also exhibits negative skewness (-0.64), indicating concentration around higher expenditure values. The kurtosis value of 2.88 further suggests an approximately normal distribution. The Jarque-Bera probability of 0.217, being greater than 0.05, confirms the normality of the series.

The interest rate (INT) variable shows notable volatility compared to the other variables. The mean value of -0.18 and a large standard deviation of 14.30 indicate substantial fluctuations in interest rate movements during the study period. The maximum and minimum values of 18.18 and -65.86 respectively reveal periods of extreme interest rate variations, likely reflecting macroeconomic instability and policy adjustments in Nigeria. The skewness value of -2.52 indicates that the distribution is highly negatively skewed, while the kurtosis value of 11.67 suggests a leptokurtic distribution characterized by extreme values and heavy tails. Although the Jarque-Bera statistic is relatively high, the associated probability value of 0.052 is marginally above the 5% significance level, implying that the null hypothesis of normality cannot be rejected at the conventional level.

Table 4.2 Correlation Matrix of the Variables

Variables	INV	HHOUS	HELEC	INT
INV	1.000000			
HHOUS	0.494555	1.000000		
HELEC	0.503846	0.512979	1.000000	
INT	0.269745	0.460612	0.454553	1.000000

Source: Author's Computation (2026)

The correlation matrix as shown in Table 2 reveals that the degree and direction of association among private investment (INV), household expenditure on housing (HHOUS), household expenditure on electricity (HELEC), and interest rate (INT). The results indicate that private investment has a positive relationship with all the explanatory variables included in the model. Specifically, private investment is moderately positively correlated with household expenditure on housing (0.494555) and household expenditure on electricity (0.503846). This implies that increases in household spending on housing and electricity are associated with increases in private investment in Nigeria. The positive relationship may reflect the role of household demand in stimulating economic activities and investment expansion. The correlation between private

investment and interest rate (0.269745) is positive but relatively weak, suggesting that although interest rates influence investment, the relationship is not particularly strong within the study period.

The table further reveals moderate positive correlations among the explanatory variables themselves. Household expenditure on housing is positively correlated with household electricity expenditure (0.512979), indicating that increases in housing-related consumption are often accompanied by higher electricity expenditure. Similarly, interest rate shows positive correlations with both housing expenditure (0.460612) and electricity expenditure (0.454553). Importantly, none of the correlation coefficients exceeds the threshold of 0.80 commonly associated with serious multicollinearity problems.

Table 3 ADF Unit Root Test for Stationarity

Variable	Level I(0)			First differencing I(1)			Order of Integration
	ADF t-Statistics	t.CV @5%	Prob.	ADF t-Statistics	t.CV @5%	Prob.	
INV	-0.971551	-2.933158	0.7547	-3.894837	-2.933158	0.0045	I(1)
HHOUS	-2.284948	-2.931404	0.1813	-7.900227	-2.933158	0.0000	I(1)
HELEC	-2.238179	-2.931404	0.1963	-7.857854	-2.933158	0.0000	I(1)
INT	-7.530829	-2.931404	0.0000				I(0)

Source: *Author's Computation (2026)*

The Augmented Dickey-Fuller (ADF) unit root test results in Table 3 reveal that private investment (INV), household expenditure on housing (HHOUS), and household expenditure on electricity (HELEC) are non-stationary at level, as their ADF t-statistics are less than the 5% critical values and their probability values are greater than 0.05. However, after first differencing, the variables become stationary, with ADF statistics greater than the critical values in absolute terms and probability values less than 0.05. This indicates that INV, HHOUS, and HELEC are integrated of order one, I(1). In contrast, interest rate (INT) is stationary at level since its ADF statistic of -7.530829 exceeds the 5% critical value in absolute terms and the probability value of 0.0000 is less than 0.05, implying that the variable is integrated of order zero, I(0). The mixed order of integration among the variables, with some integrated at I(1) and others at I(0), provides strong justification for the use of the Error Correction Model (ECM) estimation technique. According to Engle and Granger (1987) and Pesaran et al. (2001), ECM is appropriate when variables are integrated at mixed orders but are cointegrated in the long run. The ECM framework is particularly suitable because it captures both the short-run dynamics and long-run equilibrium relationships among the variables while correcting any disequilibrium that may occur in the short run.

Table 4.4 ARDL Bounds Test for Cointegration

Test Statistic	Value	Significance Level	I(0) Bound	I(1) Bound
F-statistic	4.893541	10%	2.37	3.20
k = 3		5%	2.79	3.67
		1%	3.65	4.66

Source: *Author's Computation (2026)*

Table 4 shows the ARDL Bounds Test result conducted to determine the existence of a long-run equilibrium relationship among private investment (INV), household expenditure on housing (HHOUS), household expenditure on electricity (HELEC), and interest rate (INT). The computed F-statistic of 4.893541 is greater than both the lower bound I(0) and upper bound I(1) critical values at all conventional significance levels, including the 5% critical bounds of 2.79 and 3.67 respectively. Since the F-statistic exceeds the upper bound critical value, the null hypothesis of no long-run relationship is rejected. This implies that a stable long-run equilibrium relationship exists among the variables in the model. The result therefore confirms that household expenditure on housing, household expenditure on electricity, and interest rate jointly influence private investment in Nigeria over the long run. The existence of cointegration further justifies the use of the Error Correction Model (ECM) for estimation.

Table 5 Error correction model (ECM) estimation

Variable	Coefficient	Std. Error	t-Statistic	Probability
D(INV(-1))	0.496354	0.131628	3.770886	0.0006
D(HELEC)	-0.288791	0.373765	-0.772653	0.4451
D(HELEC(-1))	-0.798549	0.381037	-2.095728	0.0436
CointEq(-1)*	-0.091139	0.034668	-2.628892	0.0128
R-squared	0.353938			
Adjusted R-squared	0.302933			
S.E. of Regression	0.921489			
Durbin-Watson Stat	1.953669			

Source: *Author's Computation (2026)*

The Error Correction Model (ECM) in Table 5 captures both the short-run dynamics and the long-run adjustment mechanism among the variables. The estimated short-run ECM equation derived from the result is expressed as:

$$\Delta INV_t = 0.496354\Delta INV_{t-1} - 0.288791\Delta HELEC_t - 0.798549\Delta HELEC_{t-1} - 0.091139ECT_{t-1}$$

The result shows that the lagged value of private investment, D(INV(-1)), has a positive and statistically significant effect on current private investment at the 1% significance level, with a coefficient value of 0.496354 and a probability value of 0.0006. This implies that a 1% increase in previous year private investment leads to approximately a 0.50% increase in current private investment in Nigeria. The positive relationship suggests persistence in investment behaviour, where previous investment activities stimulate subsequent investment through increased capital accumulation and business confidence. This finding aligns with the accelerator investment theory

and supports the empirical findings of Ogundipe and Alege (2018) as well as Nwosa (2020), who found that increased economic activity and consumption demand stimulate investment expansion in Nigeria.

The contemporaneous electricity expenditure variable, D(HELEC), carries a negative coefficient of -0.288791 but is statistically insignificant, given its probability value of 0.4451 which exceeds the 5% significance level. This indicates that although a 1% increase in household electricity expenditure reduces private investment by approximately 0.29% in the short run, the effect is not statistically strong enough to significantly influence investment behaviour within the same period. However, the lagged electricity expenditure variable, D(HELEC(-1)), is negative and statistically significant at the 5% level, with a coefficient of -0.798549 and probability value of 0.0436. This implies that a 1% increase in household electricity expenditure in the previous period reduces private investment by approximately 0.80% in the current period. The negative sign suggests that rising electricity costs crowd out savings and productive investment due to the high cost of energy consumption and dependence on alternative power sources such as generators in Nigeria. This finding is consistent with the studies of Akinlo (2009), Adenikinju (2005), Onisanwa and Adaji (2020), and Wokoma et al. (2021), all of whom reported that high electricity costs and unreliable power supply negatively affect investment and productivity in Nigeria.

The error correction term, represented by CointEq(-1), is negative and statistically significant at the 5% level, with a coefficient of -0.091139 and a probability value of 0.0128. The negative sign conforms to theoretical expectations and confirms the existence of a long-run equilibrium relationship among the variables. The coefficient indicates that approximately 9.11% of short-run disequilibrium in private investment is corrected annually toward the long-run equilibrium path. This relatively slow speed of adjustment implies that deviations from equilibrium caused by shocks in household electricity expenditure or other macroeconomic disturbances take time to fully adjust in the Nigerian economy. The significance of the ECM term validates the appropriateness of the Error Correction Model estimation technique for the study.

Regarding the overall model performance, the R-squared value of 0.353938 indicates that approximately 35.39% of the variations in private investment are explained by the explanatory variables included in the model. The Durbin-Watson statistic of 1.953669, which is close to 2, suggests the absence of serious autocorrelation in the residuals, indicating that the model is statistically reliable for policy interpretation and inference.

Table 6: Diagnostics Tests

TESTS	F-STATISTICS	PROBABILITY	DECISION RULE
Normality Test	1.550853	0.460507	*Normally Distributed*
Serial Correlation	1.019110	0.3991	*Absence of Serial Correlation*
Heteroscedasticity	1.081538	0.4293	*Absence of Heteroscedasticity*
Ramsey-RESET	6.430889	0.2131	*Model is Well specified*

Source: *Author's Computation (2026)*

In Table 6, the normality test result shows a probability value of 0.460507, which is greater than the 5% significance level, indicating that the residuals are normally distributed. This implies that the error terms of the model satisfy the normality assumption required for valid statistical inference and reliable hypothesis testing. The serial correlation test also reveals a probability value of 0.3991, which exceeds 0.05, leading to the acceptance of the null hypothesis of no serial correlation. This suggests the absence of autocorrelation among the residuals, implying that the model errors are

independently distributed over time. Similarly, the heteroscedasticity test produces a probability value of 0.4293, indicating the absence of heteroscedasticity in the model. This means that the variance of the residuals remains constant across observations, thereby ensuring the efficiency and consistency of the estimated coefficients. The Ramsey RESET test result, with a probability value of 0.2131, confirms that the model is correctly specified since the null hypothesis of correct functional form cannot be rejected. This indicates that the model does not suffer from omitted variable bias or functional form misspecification.

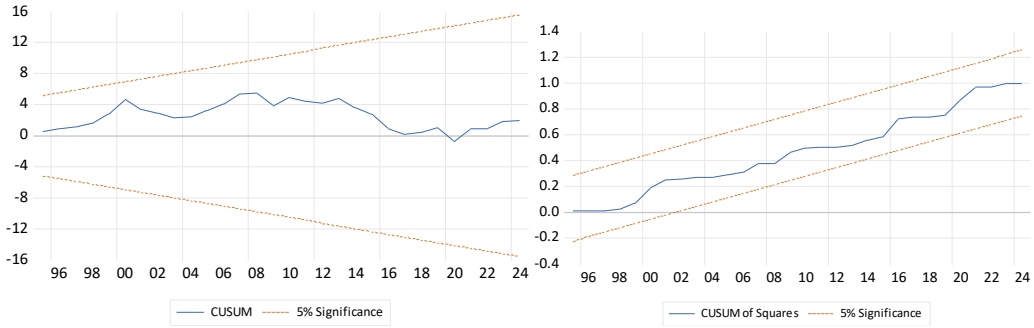

Figure 1: CUSUM and CUMSUMSQ Stability Test

Source: *Author's Computation (2026)*

Figure 1 presents the CUSUM and CUSUMSQ stability tests used to examine the structural stability of the estimated parameters over the study period. The plots of both the CUSUM and CUSUMSQ statistics remain within the critical bounds at the 5% significance level, indicating that the estimated coefficients are stable throughout the sample period. This suggests that there are no significant structural breaks or parameter instabilities arising from macroeconomic shocks, policy changes, or economic crises during the period under review. Therefore, the stability test confirms that the ECM estimates are robust, reliable, and suitable for policy analysis and forecasting.

5. Conclusion and Policy recommendations

This study examined the impact of household consumption expenditure on private investment in Nigeria, with particular emphasis on household expenditure on electricity and housing, while controlling for interest rate dynamics. Using the Error Correction Model (ECM) framework, the study distinguished between short-run dynamics and long-run equilibrium adjustments among the variables. The findings reveal that household electricity expenditure exerts a negative effect on private investment, particularly in the lagged period where the effect was statistically significant. This suggests that rising electricity-related household costs reduce the ability of households and firms to channel resources toward productive investment activities. The result reflects the structural inefficiencies within Nigeria's power sector, where persistent electricity shortages and dependence on alternative energy sources increase consumption burdens without corresponding improvements in productivity.

The study further reveals that previous levels of private investment positively influence current investment performance, indicating persistence in investment behaviour and capital accumulation over time. The error correction mechanism was found to be negative and statistically significant,

confirming the existence of a stable long-run equilibrium relationship among the variables and indicating that short-run disequilibrium adjusts gradually toward long-run equilibrium. Overall, the findings suggest that the structure and composition of household consumption expenditure matter significantly for investment outcomes in Nigeria. In particular, rising expenditure on basic necessities such as electricity appears to crowd out productive investment by reducing disposable income and savings available for capital formation.

The results imply that the challenge facing Nigeria is not merely the level of household consumption expenditure, but the inefficient and consumption-driven nature of spending caused by infrastructural deficiencies, especially in the energy sector. High household spending on electricity, driven largely by unreliable public power supply and dependence on generators, weakens the investment capacity of households and firms. Therefore, improving infrastructural efficiency and reducing household consumption burdens are essential for enhancing private investment and achieving sustainable economic growth in Nigeria.

Policy Recommendations

The Nigerian government should intensify reforms in the electricity sector to reduce the high cost burden of household electricity expenditure. Investment in power generation, transmission, and distribution infrastructure should be prioritized to ensure stable and affordable electricity supply. Improving public electricity access would reduce dependence on expensive alternative energy sources such as generators, thereby freeing household income and business resources for productive investment activities. This recommendation is justified by the finding that rising electricity expenditure negatively affects private investment in Nigeria.

Policymakers should promote investment-friendly household welfare policies aimed at reducing excessive consumption pressure on basic necessities. In particular, affordable housing schemes, improved urban infrastructure, and targeted subsidies for low-income households can help reduce the proportion of household income devoted to non-productive consumption expenditure. Lower housing and utility costs would improve household savings capacity and enhance the availability of funds for private investment and entrepreneurial activities.

Monetary authorities should maintain a stable and investment-supportive interest rate environment capable of stimulating private sector borrowing and capital formation. Since investment behaviour tends to persist over time, policies that encourage long-term financing, credit accessibility, and macroeconomic stability will reinforce investment growth in Nigeria. Coordinated fiscal and monetary policies aimed at controlling inflation and stabilizing financial markets are therefore necessary to strengthen the long-run relationship between household consumption patterns and private investment growth.

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