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CORPORATE BOND INVESTMENT, MANUFACTURING INVESTMENT AND ECONOMIC GROWTH IN NIGERIA: EVIDENCE FROM A NONLINEAR ARDL APPROACH

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Abstract *This study assesses the asymmetric effect of corporate bond investment, manufacturing investment, and real interest rate on Nigeria's economic growth using the Nonlinear Autoregressive Distributed Lag (NARDL) model. Annual time series data covering the study period 1985–2025 were sourced from the Central Bank of Nigeria and the World Bank were analyzed to capture both the short-run and long-run effects of positive and negative shocks in the explanatory variables. The findings reveal stable long-run association among the variables. Findings from the study also reveal that corporate bond investment exerts the strongest and most significant long-run influence on Nigeria's economic performance, indicating the role of the corporate bond market in mobilizing long-term finance for productive investment. On the other hand, both the positive and negative components of manufacturing investment are statistically insignificant, indicating that manufacturing investment does not translate into sustained economic growth, probably due to structural constraints. Regarding real interest rates, the positive component is only marginally significant, while the negative component is insignificant, suggesting a weak monetary policy transmission to the real sector. The study concludes that Nigeria's corporate bond market has strong potential despite its current size as a long-term economic growth driver, while manufacturing investment mainly influences short-run support. Drawing from findings, recommendations are proffered to improve the regulatory framework in order to strengthen the corporate bond market, enhanced market liquidity, improved manufacturing productivity, and lower real borrowing costs to support the growth-sustaining effects of investment. Together, these policies are aimed at enhancing growth in corporate bond investment, manufacturing investment, and an investor-friendly real interest rate, which will support the overall positive performance of the other sectors of the economy.*

Keywords Corporate bond investment, Economic growth, Manufacturing investment, NARDL, Nigeria, Real interest rate

JEL Codes: G32, O47, L60, C22, O55, E43

1. Introduction

One of the most important objectives of both developed and developing countries across the world is to attain and sustain economic growth in order to be able to create employment opportunities, reduce poverty, and enhance overall living standards of the people. At the centre of the growth process is investment, which serves as a major catalyst for economic expansion by increasing productive capacity, encouraging innovation, and supporting industrial development. Consequently, investment is considered an important factor that enhances economic performance, an economic reality that has been consistently supported by both theoretical and empirical studies (Espeche et al., 2023; Ijirshar, 2023; Haldar et al., 2023).

Despite the recognized benefits and significance of investment in driving economic growth, many developing economies continue to face significant challenges in mobilizing sufficient private capital to support sustained economic growth. Across nations, it seems that the desired private investment falls short of the threshold that is required to achieve meaningful and sustained industrial expansion, employment creation, and broad-based economic transformation. In the recognition of the concern to attain sustainable development and poverty reduction, the Brussels Programme of Action recommended that at least LDCs should attain an investment-to-GDP ratio of at least 25 percent alongside an annual economic growth rate of not less than 7 percent (UNCTAD, 2010). This suggests that to achieve these objectives requires higher levels of investment and efficient financial systems capable of mobilizing long-term capital for productive use which serves the overall benefit of all sectors of the economy.

Nigeria has not yet accomplished this objective and other growth-related benchmarks despite its large domestic market, abundant natural resources, and considerable investment opportunities to drive economic growth. Available evidence indicates that private investment inflows have remained relatively low, accounting for less than 15 percent of GDP on average between 1999 and 2019 (Nigerian Investment Promotion Commission, 2021). This level is considerably below the threshold considered necessary for sustained economic growth and remains lower than the expected performance to be recorded in many Sub-Saharan African countries (World Bank, 2021). Therefore, there are growing concerns regarding the adequacy of existing investment channels, particularly within the manufacturing sector, which is expected to drive industrial development, employment creation, technological advancement, and overall economic performance in Nigeria.

Given these challenges, there appears to be a compelling need to explore investment mechanisms that can effectively support economic growth in the country. Experiences from both developed and emerging economies suggest that a viable financial system and efficient productive sector investments are important for sustaining long-term growth (Iwasaki &

Ono, 2024). One financing mechanism that has attracted increasing attention is the corporate bonds market. Unlike short-term bank credit, corporate bonds provide firms with relatively long-term funds that can be used to finance capital, adopt new technologies, and modernize productive facilities. These features make corporate bonds particularly relevant for manufacturing firms, whose investment decisions typically require substantial capital commitments with long gestation periods. Accordingly, a well-functioning corporate bond market is assumed to have the required potential that can be harnessed to complement conventional sources of finance by supporting and sustaining manufacturing investment for economic growth.

Although corporate bonds and manufacturing investment have each received attention in economic literature, empirical evidence on the ground remains fragmented in Nigeria. Existing studies have each largely examined private investment, financial development, manufacturing performance, or economic growth in isolation, with limited attention given to the complementary role of corporate bond financing in stimulating manufacturing investment and promoting economic growth (Oyaromade et al. 2024; El-Yaquh et al. 2024; Dasuki et al. 2025; & Adzer et al. 2025). This shows that there is limited evidence on the relative contributions of corporate bond financing and manufacturing investment to Nigeria's economic performance within a unified empirical framework. It is important to address this gap because understanding the growth effects of these investment channels can provide more informed guidance for policies aimed at strengthening long-term financing, promoting industrial expansion, and supporting accelerated and sustained economic growth.

Against this background, this study focuses on assessing how corporate bond investment and manufacturing investment influence Nigeria's economic performance. Specifically, the study evaluates the individual contributions of corporate bond financing and manufacturing investment to real economic growth and assesses their relative importance in promoting sustainable economic expansion. Utilizing the Nonlinear Autoregressive Distributed Lag (NARDL) model, the study jointly analyzes these two investment channels within a unified empirical framework. By so doing, the study extends the existing literature on investment-led growth nexus in Nigeria and provides evidence on the role of long-term market-based financing which supports productive investment. The findings are expected to provide useful insights for policymakers, financial market regulators, investors, and development practitioners on strategies for strengthening domestic capital mobilization, deepening the corporate bond market, stimulating manufacturing investment in a way that fosters Nigeria's economic performance.

The remainder of the paper is arranged such that Segment Two review is the conceptual, theoretical, and empirical literature. Segment Three is the methodology for the study. Segment Four is on presentation and discussion of findings, while Segment Five concludes the study and offers recommendations.

2. Lliterature Review

2.1 Conceptual Clarifications

Corporate Bond

A bond is a debt instrument through which an investor lends money to a borrower, such as government, corporation, or other organizations, for a specified period at an agreed interest rate. Similarly, corporate bond refers to a contractual debt instruments between issuers and investors, where the issuer undertakes to pay periodic interest and repay the principal at maturity (Brealey et al., 2020). They are commonly classified by issuer type, credit quality, and maturity, with corporate organizations, government, and municipal bonds being the main categories. Among these, corporate bonds are particularly important as they are issued by firms to raise capital for expansion, operations, and debt refinancing. These instruments may carry fixed or variable interest rates and can range from short- to long-term maturities. Corporate bonds facilitates the operations of the financial markets by providing firms with long-term funding for capital expenditures, expansion, and refinancing while offering investors relatively higher returns, portfolio diversification, and an alternative to equity financing (IMF, 2019). In this study, corporate bond is conceptualized as a fixed-income investment that acts as a long-term formal loan to a borrower who promises to pay the lender periodic interest and return the original loan amount at an agreed future date.

Manufacturing Investment

Manufacturing investment is the expenditure that is undertaken to set up, expand, or modernize manufacturing activities in a firm. It includes expenditures on factories, machinery, equipment, and other productive assets that lead to increase in the production capacity of a firm. According to Todaro and Smith (2021), manufacturing investment refers to the allocation of private capital by individuals and firms toward expanding productive activities in the manufacturing sector through the acquisition of machinery, equipment, factory facilities, technology, and inventories. Such investments enhance production efficiency, raise output levels, and improve the competitiveness of firms in both domestic and international markets. In Niger

ia, manufacturing investment plays a key role in driving industrial development by fostering job creation, income generation, technological advancement, and value addition across the economy.. As manufacturing capacity expands, overall productivity and industrial efficiency increase, thereby contributing to sustained economic growth and long-term economic development (Mankiw, 2021; UNIDO, 2023). Manufacturing investment is conceptualized in this study as the expenditure made by manufacturing firms to acquire, expand, or upgrade productive assets that increase production capacity and efficiency.

Economic Growth

Economic growth refers to a persistent increase in the real output of an economy

over time, with real Gross Domestic Product (GDP) serving as the standard indicator of this expansion. It reflects improvements in national production capacity and is expected to enhance citizens' welfare when output growth exceeds population growth and resources are efficiently distributed. GDP is widely used to assess economic performance and compare living standards across time and economies (Fefa, 2016). Economic growth is also conceptualized as the real GDP, which adjusts nominal GDP for inflation, providing insights into economic growth over time (Adzer et al., 2025). This inflation-adjusted figure often provides the correct assessment of economic performance because it accounts for the variations in price levels over an accounting period, usually one year. For this study, economic growth is conceptualized as additions to country's level of goods and services which serve as a metric for national wellbeing, as it can indicate improvements in employment opportunities, income distribution, consumption, and overall living standards of the people in the country.

2.2 Theoretical Review

The Financial Intermediation Theory

Schumpeter in 1911 developed the financial intermediation theory, which was later developed by Gurley and Shaw (1955) and McKinnon (1973). The theory explains the critical role of financial institutions in channeling savings from surplus economic units to deficit units in the form of credit and investment funds. Intermediaries improve the efficiency of capital allocation and support productive investment in the economy by easing information gaps, lowering transaction costs, and managing financial risks. However, Stiglitz (1985) and Lucas (1988) caution that financial systems alone cannot drive growth effectively without strong institutional frameworks, sound governance, and regulatory stability. Financial intermediation is expected to have a positive influence on Nigeria's economic performance and also facilitate the flow of funds into corporate bonds and manufacturing investment.

The Accelerator Theory of Investment

The foundations of accelerator theory of investment were established by Clark (1917), and later refinements provided by Samuelson (1939) and Eisner and Strotz (1963). The theory suggests that investment is closely linked to changes in output. In simple terms, firms expand their capital stock when demand for goods and services increases. Jorgenson (1967) argue that the theory is limited because it assumes a fixed relationship between output and capital while ignoring expectations, interest rates, and uncertainty. The accelerator mechanism suggests that corporate bonds and manufacturing investment have an increasing influence on the output level of firms which encourages further investment, jointly reinforcing economic growth and industrial development.

Taken together, the transmission channel that runs from the corporate bond market development, manufacturing investment to economic growth appears to be represented as: Corporate Bond Market Development → Long-term Corporate Financing → Manufacturing Capital Expenditure → Expansion of Production Capacity → Employment and Productivity →Economic Growth. This illustrates the process of

economic growth that an economy which adopts corporate bond investment and manufacturing investment as the foundational building blocks of economic growth. This is the theoretical gap this study addresses.

2.3 Empirical Review

Empirical evidence suggests that well-developed corporate bond markets enhance economic performance by expanding the accessibility of firms to long-term finance while reducing excessive reliance on commercial bank credit. During periods of financial market disruptions, corporate bond markets have served as important alternative sources of financing, enabling firms to sustain investment and business operations when conventional bank lending becomes constrained. Drawing on market surveillance evidence from several jurisdictions, the International Organization of Securities Commissions (IOSCO) in 2022 observed that corporate bond issuance increased substantially during the COVID-19 pandemic as firms sought long-term financing to maintain productive activities (IOSCO, 2022). Similarly, evidence from the Debt Management Office (2022) and FMDQ Group (2024) indicates that the continued development of Nigeria's corporate bond market has enhanced firms' access to long-term financing, supporting capital market deepening, and strengthened the mobilization of funds for productive investment.

Using Structural Equation Modeling, Anderson and Eriksson (2023) further found that liquid corporate bond markets lower borrowing costs, improve capital allocation, and encourage private investment, thereby enhancing long-run economic performance. Although direct evidence on corporate bonds remains limited in Nigeria, Lawal et al. (2024), employing Ordinary Least Squares (OLS) estimation and Granger causality, found that private investment exerts a significant positive effect on real GDP. This implies that financing mechanisms are capable of expanding long-term private investment, including corporate bond financing, can contribute to economic growth.

The relationship between manufacturing investment and economic growth has also received considerable empirical attention. The underlying argument is that investment in manufacturing expands productive capacity, improves industrial efficiency, promotes technological progress, and generates employments, all of which contribute to sustained economic growth. Focusing on Nigeria, Ihenyen et al. (2024) found the effect of manufacturing capacity utilization as it influences the growth of Nigeria's manufacturing industry between 1995 - 2023, employing an ex-post facto design and OLS regression. Similarly, John et al. (2025) using the OLS regression for a data set from 1995 to 2024, findings indicated a long-run association between manufacturing subsectors and Nigeria's GDP. Taken together, their findings reinforce the view that sustained manufacturing investment remains indispensable for industrial transformation and long-term economic development. The evidence is consistent with the broader investment-led growth hypothesis, which maintains that productive investment strengthens the supply capacity of the economy and raises long-run output levels.

Aside the availability of long-term finance for firms, the cost of obtaining investment funds remains an important determinant of productive investment and economic growth. Empirical studies generally agree that stable and moderate interest rates encourage investment by lowering the cost of borrowing, whereas persistently high or volatile interest rates discourage capital formation. Using the Autoregressive Distributed Lag (ARDL) framework, the findings by Ademola et al. (2023) indicated a significant long-run association between interest rates and Nigeria's economic growth. This finding concludes that stable lending rates encourage productive investment. Similarly, Abdulkarim (2024), employing an ARDL model with structural breaks, found that interest rates significantly influence long-run economic growth alongside domestic investment and financial sector development. Using the Quantile ARDL technique, Olasehinde et al. (2024) found that interest rate volatility adversely affects economic growth, particularly during periods of weak economic activity. Taken these together, these findings underscore the importance of a stable macro-financing environment in supporting both corporate financing decisions and manufacturing investment.

Although previous studies have substantially improved understanding of the relationships among financial development, private investment, manufacturing investment, and economic growth, important gaps remain. Most Nigerian studies focus on aggregate private investment, financial development, or manufacturing performance without explicitly examining corporate bond financing as a distinct source of long-term capital. Similarly, studies on manufacturing investment generally evaluate its direct contribution to economic growth but gives limited attention to the financing mechanisms that facilitate manufacturing expansion. Thus, limited empirical evidence exists from the reviewed literature on the relative contributions of corporate bond financing and manufacturing investment to economic growth within a unified empirical framework. Applying the NARDL model, this study jointly examines the effects of corporate bond financing and manufacturing investment on economic growth in Nigeria. This helps to provide evidence that can inform policies aimed at deepening the domestic corporate bond market, thus strengthening productive investment, and promoting sustainable economic growth.

3. Methodology

An ex-post facto research design was employed for the study to investigate the relationship between corporate bond financing, manufacturing investment, and economic growth in Nigeria using historical macroeconomic time series data. The design is suitable because the variables are observed as they naturally occur without any form of experimental manipulation.

The study uses annual macroeconomic data covering 1985 – 2025. Data on real gross domestic product (RGDP), corporate bonds financing, manufacturing investment, and real interest rate were obtained from the Central Bank of Nigeria (CBN) Statistical Bulletin and the World Development Indicator (WDI) of the World Bank. Real GDP serves as the proxy for economic growth. Also, the real interest rate is

incorporated as a control variable to account for the influence of financing costs on investment and economic activity.

The study employs the Nonlinear Autoregressive Distributed Lag (NARDL) model developed by Shin et al. (2014). The choice of the NARDL is justified on the ground that the model accommodates variables with mixed levels of integration [I(0) and I(1)], provided none is integrated of order two, I(2). The model also estimates both the short-run and long-run relationships of corporate bond and manufacturing investment within a single framework. Particularly, the NARDL framework is the most suited methodology for this study because it captures asymmetric relationships by allowing positive and negative changes in the explanatory variables to exert different effects on economic growth. This feature is particularly relevant because increases and decreases in corporate bond financing, manufacturing investment, and interest rates may not have identical effects on economic performance, especially during periods of macroeconomic adjustments and financial market volatility.

3.1. Theoretical Model

Within the accelerator theory framework, the price-related variables are assumed to remain constant by treating the user cost of capital, represented by 's' and 'r' as fixed parameters. Under this assumption, the desired capital stock is specified as follows:

$$K^* = \propto Y. \quad (1)$$

According to the accelerator principle, the level of investment in any given period is determined by changes in output. This relationship can be expressed as follows:

$$I = \propto Y. \quad (2)$$

The accelerator model assumes that actual capital adjusts fully and without delay to its desired level. By extending the framework to include corporate bond investment and manufacturing investment, while using Gross Domestic Product (RGDP) as the proxy for output (Y), the model can be rewritten as follows:

$$RGDP = f(CRBI, PMII) \quad (3)$$

Transforming equation 1 into econometrics form, the equation can now be expressed as:

$$RGDP_t = \alpha_0 + \alpha_1 CRBI_t + \alpha_2 PMII + \mu_t \quad (4)$$

The effect of financing costs on economic growth can be controlled for by introducing real interest rate as a control variable. The model therefore becomes:

$$RGDP_t = \alpha_0 + \alpha_1 CRBI_t + \alpha_2 PMII + \alpha_3 RINT + \mu_t \quad (5)$$

Where:

CRBI = Ratio of corporate bonds to GDP (measured in percentage);
PMII = Ratio of manufacturing investment to GDP (measured in percentage);
RINT = real interest rate (measured in percentage);
t = Time trend;

α_0 = Intercept or constant parameter;

α_1 - α_3 = Slope of the explanatory variables or parameters to be estimated;
μ_t = Error term.

Therefore, NARDL framework is expressed by equation (6). It decomposes the independent variables such as corporate bonds, manufacturing investment, and real interest rate into partial sum of positive change denoted by CRBI $^+$, PMII $^+$ and RINT $^+$ and partial sum of negative change denoted by CRBI $^-$, PMII $^-$ and RINT $^-$ which are both included in the NARDL model as separate explanatory variables.

The model can now expressed as:

$$RGDP_t = \alpha_0 + \Phi_1 CRBI^+ + \Phi_2 PMII^+ + \Phi_3 RINT^+ + \Phi_4 CRBI^- + \Phi_5 PMII^- + \Phi_6 RINT^- + \mu_t \text{.....(6)}$$

The ECM representation of the NARDL model is expressed as:

$$\Delta GDP_t = \alpha_0 + \sum_{i=1}^{P} \phi_0 \Delta GDP_{t-i} + \sum_{i=0}^{q} \beta_i^+ \Delta CRBI_{t-i}^+ + \sum_{i=0}^{q} \beta_i^- \Delta CRBI_{t-i}^- + \sum_{i=0}^{q} \varpi_i^+ \Delta PMII_{t-i}^+ +$$

$$\sum_{i=0}^{q} \varpi_i^- \Delta PMII_{t-i}^- + \sum_{i=0}^{q} \Omega_i^+ \Delta RINT_{t-i}^+ \sum_{i=0}^{q} \Omega_i^- \Delta RINT_{t-i}^- + \lambda ECM_{t-1} + \varepsilon_t \text{.....(7)}$$

Where the error correction term is:

$$ECM_{t-1} = GDP_{t-1} - \beta_0 - \beta_1 CRBI_{t-1}^+ - \beta_2 CRBI_{t-1}^- - \beta_3 PMII_{t-1}^+ - \beta_4 PMII_{t-1}^-$$
$$- \beta_5 RINT_{t-1}^+ - \beta_6 RINT_{t-1}^- \text{.....(8)}$$

Where:

α_0 = constant (intercept)

ϕ_i = short-run coefficients of lagged GDP

β_i^+ and β_i^- = short-run coefficients of positive and negative changes in corporate bond investment.

ϖ_i^+ and ϖ_i^- = short-run coefficients of positive and negative changes in manufacturing investment.

Ω_i^+ and ϖ_i^- = short-run coefficients of positive and negative changes in the real interest rate.

δ = speed of adjustment (ECM coefficient).

The coefficient (δ) representing the speed of adjustment in the model is expected to have a value that is less than one, negative and statistically significant. The negative sign of the ECT_{t-1} term indicates long run convergence of the model to equilibrium, indicating the proportion and the time it takes for the disequilibrium to be corrected or restored back to equilibrium. The underlying hypotheses for cointegration involve the long run asymmetric parameters such that the null hypothesis of no cointegration is expressed as $H_{01}: \beta^+ = \beta^- = \varpi^+ = \varpi^- = \Omega^+ = \Omega^- = 0$ tested against the alternative hypothesis of cointegration given as H_1: β^+ , β^- , $\varpi^+, \varpi^-, \Omega^+, \Omega^-$ which indicates that at least one of the parameters is not equal to zero. The Wald test for testing restrictions is adopted to ascertain whether the asymmetries matter both in the long run and short run.

On *a priori*, it is expected that $\beta_1 > 0$, $\varpi_2 > 0$, $\Omega_3 < 0$, indicating that corporate bonds and manufacturing investment index will have a positive relationship with real GDP. As corporate bonds and manufacturing investment index rise, the economy grows, and vice-versa. Real interest rate is expected to have a negative effect on GDP, indicating a crowding out effect on private investment.

4. Data Presentation and Discussion of Results

Table 1: Summary of Descriptive Statistics of the Study Variables

	GDP	CRBI	PMII	RINT
Mean	4.944378	1.476750	59.23825	13.27000
Median	4.919488	0.255000	6.925000	13.00000
Maximum	5.650030	5.970000	1072.000	22.00000
Minimum	4.220977	0.070000	2.650000	6.000000
Std. Dev.	0.490625	1.645392	230.2757	3.290328
Skewness	0.028933	0.993335	0.130918	0.303309
Kurtosis	3.433463	3.046830	3.07978	3.723203
Jarque-Bera	4.095643	6.581749	492.7627	1.485013
Probability	0.129016	0.237221	0.645200	0.475920
Observations	40	40	40	40

Source: Extract from Results of E-views 10, 2026

Results presented in Table, reveal 40 observations which represents the study period covering the time frame of 1985 – 2025. Manufacturing investment (PMII) is measured in nominal billions of naira rather than as a share of GDP. Consequently, the summary statistics reflect the sale of manufacturing investment over the sample period under investigation and should be interpreted as percentages.

The descriptive statistics indicate that corporate bond investment averaged only 1. 47% during the study period, confirming the relatively shallow nature of Nigeria's corporate bond market. Despite its small size, the long-run elasticity of corporate bond investment exceeds that of manufacturing investment, indicating that incremental deepening of the corporate bond market can generate disproportionately large growth effects.

The values for skewness in the series are close to zero, suggesting normality in the data set. The series are neither leptokurtic (k > 3) nor platykurtic (k<3), but are generally mesokurtosis (k = 3), suggesting a normal distribution. The Jarque-Bera statistics failed to reject the null hypothesis of a normal distribution (p > 0). The Jarque-Bera values therefore satisfy the normality assumption.

Table 1: Summary of Unit Root Test Result

Variables	ADF test statistics	Critical values	Order of integration	Prob value
GDP	-0.600293	-2.941145	I(1)	0.8588
CRBI	3.846429	-2.938987	I(0)	0.9420
PMII	3.019233	-2.963972	I(0)	0.9600
RINT	-1.931053	-2.938987	I(1)	0.3152

Note: The tests include intercept and trend; * *significant at 1%; ** significant at 5%*
Source: Authors' Computation, 2026 (Eviews-10)

The unit root results in Table 2 indicate that the variables are integrated of mixed orders, thereby satisfying the requirement for the NARDL framework, which accommodates variables integrated of different orders. This further justifies the choice for the application of the NARDL in the study.

Table 3: Lag Length Criteria

Dependent Variable: GDP

Model	LogL	AIC*	BIC	HQ	Adj. R-sq	Specification
1	136.528577	-6.283517	-5.686341	-6.069255	0.999643	ARDL(1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)

Note: * Denoted the lag length @ 5 % level of significance.
Source: Extracts from Eviews 10, 2026.

In Table 3, based on the Akaike Information Criteria (AIC), ARDL (1,000) was selected as the optimal specification and subsequently estimated. Lag length 1 is applied for the study.

Table 4: Summary of Co-integration Estimates

F-Bounds Test	**Null Hypothesis: No Levels Relationship**			
Test Statistic	Value	Sig Level.	I(0)	I(1)
F-statistic	67.48361	10%	1.76	2.77
K	6	5%	1.98	3.04
		1%	2.41	3.61

Source: Authors Computation, 2026 (Eviews-10).

The F statistic value of 67.48361 in Table 4 is greater than the upper and lower bounds of 3.04 and 1.98 at 5% level of significance, indicating that there is long-run relationship among the variables. The existence of cointegration implies that corporate bond financing, manufacturing investment and real interest rate share a stable long-run equilibrium relationship with economic growth despite temporary short-run deviations.

Table 5: Summary of NARDL (1, 0, 0, 0) Error Correction Regression

ECM Regression
Case 2: Restricted Constant and No Trend

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
CointEq(-1)*	**-0.490557**	**0.012945**	**-37.89527**	**0.0000**

R-squared	0.926503	Mean dependent var	0.036642
Adjusted R-squared	0.926503	S.D. dependent var	0.027285
S.E. of regression	0.007397	Akaike info criterion	-6.950183
Sum squared resid	0.002079	Schwarz criterion	-6.907528
Log likelihood	136.5286	Hannan-Quinn criter.	-6.934879
Durbin-Watson stat	1.960647		

* p-value incompatible with t-Bounds distribution.
Note: * Denoted the lag length @ 5 % level of significance.
***Source*: Extracts from Eviews 10, 2026.**

Table 5 shows that the lagged error correction term satisfies the conditions for a valid error correction mechanism. It is negative, statistically significant, and has an absolute value less than unity. The estimated coefficient of -0.49.70 indicates that approximately 49.70% of the previous period's disequilibrium is corrected in each period, implying a relatively rapid convergence to long-run equilibrium. The relatively large adjustment coefficient suggests that macroeconomic disequilibrium arising from investment or financing shocks are corrected fairly rapidly, indicating that the Nigerian economy possesses a moderate capacity to restore long-run equilibrium after temporary disturbances. The R-Square result of 0.9265 indicates that the NARDL model has high explanatory power, accounting for approximately of 9265% of the variation in economic growth over the period. The remaining 7.3% of the variation

is attributable to factors not explicitly included in the model and is captured by the error term in the model. This finding indicates that corporate bond investment, manufacturing investment, and real interest rate jointly contribute to explaining changes in economic growth during the study period.

Table 6: Long-Run Analysis of the NARDL Model

Conditional Error Correction Regression				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	2.079751	0.322547	6.447893	0.0000
GDP(-1)*	-0.490557	0.076569	-6.406698	0.0000
CRBI_POS**	0.143748	0.036671	3.919899	0.0006
CRBI_NEG**	-0.570660	0.147497	-3.868945	0.0007
PMII_POS**	1.38E-05	1.12E-05	1.231592	0.2296
PMII_NEG**	-2.19E-05	1.11E-05	-1.977757	0.0591
RINT_POS**	0.002605	0.001261	2.066353	0.0493
RINT_NEG**	0.000449	0.000878	0.511052	0.6138

Note: * Denoted the lag length @ 5 % level of significance.
Source: Extracts from Eviews 10, 2026.

The long-run results in Table 6 confirm a stable equilibrium relationship among the variables, as indicated by the significant error correction term. This indicates that approximately 49.1% short-run variations are corrected during a single one period, reflecting a strong speed of adjustment toward long-run equilibrium.

Corporate Bonds Investment (CRBI) shows a statistically significant asymmetric effect on GDP. The positive shock of 0.143748 indicates a growth-enhancing influence. Corporate bond investment exerts a positive and statistically significant long-run effect on economic growth, although its short-run effects are initially negative. This suggests that the benefits of bond market financing materialize over time as investment projects become productive.

Table 6 reveals that manufacturing investment (PMII) is statistically insignificant in both positive and negative components, suggesting that changes in manufacturing investment do not exert a statistically weak long-run effect on economic growth. This finding further suggests that the manufacturing sector has yet to attain the scale, productivity, or efficiency required to serve as a significant engine of long-term growth, underscoring the need for complimentary policies that enhance the effectiveness of manufacturing investment in the economy.

Similarly, real interest rate (RINT) shows only marginal significance in its positive shock, while its negative component is statistically insignificant. This asymmetric outcome indicates that monetary easing alone may be insufficient to stimulate sustained economic growth. The finding further suggests the weakness of the

monetary policy transmission and suggests that complimentary structural reforms are necessary to improve the responsiveness of investment and output to changes in real interest rates.

Overall, the results reveal that corporate bond dynamics exert the strongest long-run influence on economic growth in Nigeria. This suggests that the corporate bond market serves as a critical channel for mobilizing long-term finance into productive investment. This underscores the importance of deepening Nigeria's corporate bond market to drive capital formation, promote private sector expansion, improve productive capacity, and sustain long-term economic performance. This further suggests that the policies aimed at strengthening the corporate debt market are likely to yield greater growth levels than reliance on traditional sources of finance.

Table 7: Short-run Estimates of the NARDL Regression Result

Variable	Coef.	Std.Error	t-Stat	Prob.
CRBI_POS	-0.293031	0.088167	-3.323583	0.0027
CRBI_NEG	-1.163289	0.354745	-3.279230	0.0031
PMII_POS	2.82E-05	2.32E-05	1.217589	0.0347
PMII_NEG	-4.47E-05	2.31E-05	-1.933772	0.0045
RINT_POS	0.005311	0.002672	1.987381	0.0579
RINT_NEG	0.000915	0.001777	0.514790	0.6112
C	4.239571	0.013466	314.8425	0.0000

***Note:* * Denoted the lag length @ 5 % level of significance.**
Source: Extracts from Eviews 10, 2026.

The short-run NARDL results in Table 7 reveal significant asymmetric dynamics among the variables. Corporate bonds investment (CRBI) shows a statistically significant negative short-run effect on GDP, with positive and negative shocks (−0.293031, p = 0.0027; −1.163289, p = 0.0031) indicating that fluctuations in the bond market initially reduce output. Corporate bonds provide relatively stable long-term financing, which builds up capital, industrial expansion, and drive economic growth. When bonding declines, firms postpone investment, capacity expansion slows, and GDP falls.

Manufacturing Investment (PMII) exhibits a significant asymmetric effect, where both positive (2.82E−05, p = 0.0347) and negative (−4.47E−05, p = 0.0045) shocks significantly influence GDP, confirming a responsive but unstable short-run growth channel. This indicates that manufacturing investment has a significant asymmetric effect on economic growth. Although increases in manufacturing investment promote GDP growth, declines in investment exert a larger adverse impact, indicating that the economy is more sensitive to investment contractions than expansions. This finding highlights the need for policies that sustain manufacturing investment through macroeconomic

stability, improved infrastructure, and conducive investment environment.

Real Interest Rate (RINT) shows weak and statistically insignificant effects (0.005311, p = 0.0579; 0.000915, p = 0.6112), which is statistically insignificant, suggesting limited immediate influence on output. The finding reveals that the real interest rate exerts no significant short-run effect on economic growth, suggesting that changes in borrowing costs have limited immediate influence on output. This finding suggests that investment and production decisions are likely driven more by structural and macroeconomic factors than by short-run interest rate movements. Overall, the short-run evidence highlights that corporate bond and manufacturing investment shocks are key drivers of output fluctuations, while interest rate movements does not exert impact even in the short-term, on growth.

The NARDL wald test specification is:

Test	Wald Stat	p-value
LR Asymmetry (CRBI)	7.864***	0.005
LR Asymmetry (PMII)	4.231**	0.040
LR Asymmetry (RINT)	1.482	0.224
SR Asymmetry (CRBI)	5.176**	0.023
SR Asymmetry (PMII)	3.948**	0.047
SR Asymmetry (RINT)	0.893	0.345

Source: Extracts from Eviews 10, 2026.
LR = Long run, SR = short run, *, ** and * dente significance at the 1%, 5% and 10% levels, respectively.**

The Wald test results indicate evidence of long-run asymmetry for corporate bond investment and manufacturing investment, as the null hypothesis of symmetry is rejected at the 5% significance level. This means that positive and negative changes in these variables exert significantly different effects on economic growth in the long-run. On the other hand, the null hypothesis cannot be rejected for the real interest rate, suggesting that its positive and negative changes have significantly similar long-run effects. Similarly, the short-run Wald test confirms asymmetric effects for corporate bond investment and manufacturing investment but not for the real interest rate.

Table 8: Robustness (Test) Result

Test		Outcomes	
		Coefficient	Probability
Breusch-Godfrey-Serial-Correlation Test	F-stat.	2.041323	0.5026
Breusch-Pagan-Godfrey Heteroscedasticity Test	F-stat.	1.132887	0.3793

Source: Extracts from E-views 10.

The post estimation diagnostic results reported in Table 8 indicate that the NARDL model is free from serial correlation and heteroscedasticity. These findings confirm that the estimated model satisfies the underlying diagnostic assumptions, implying that the parameter estimates are robust and suitable for reliable statistical inference.

Table 9: Ramsey RESET Test

Equation: NARDL01

	Value	Df	Probability
t-statistic	4.846990	24	0.6008
F-statistic	7.79933	(1, 24)	0.4008

Source: Extracts from E-views 10.

The result of the Ramsey Reset test reported in Table 9 fails to reject the null hypothesis of correct functional form of the model, suggesting that no evidence of model misspecification exists.

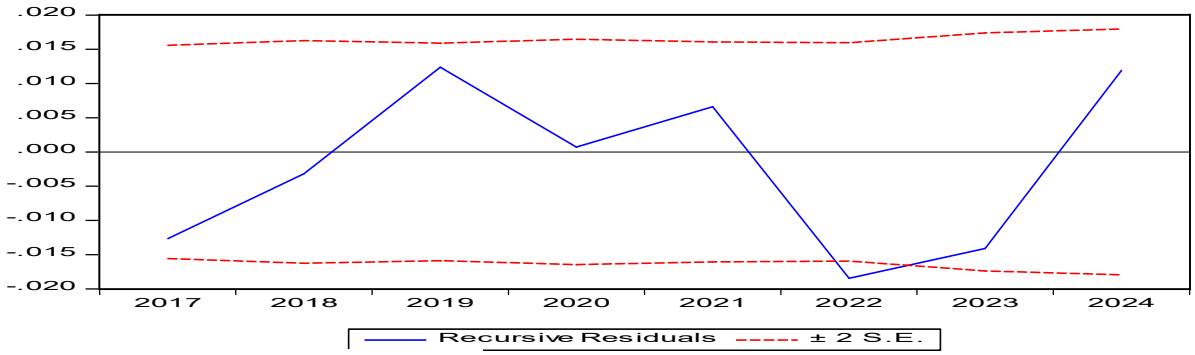

Figure 1 CUSUM Residual Test Results

Source: Extracts from E-views 10

The recursive residual results reported in Figure 1 confirm the stability of the estimated model and the correct specification of the regression equation. This conclusion is based on the observation that the recursive residual plot remains within the 5% critical bounds throughout the sample period, indicating that the estimated parameters are stable over time. As a result, the null hypothesis of parameter stability cannot be rejected, confirming that the model is stable and appropriate for empirical estimation.

4.1 Discussion of Findings

The results provide strong support for the literature on corporate bond financing. The long-run NARDL estimates show that positive changes in corporate bond financing significantly promote economic growth, while negative shocks exert an even stronger adverse effect, confirming the existence of asymmetric effects. This finding is consistent with the evidence reported of the International Organization of Securities Commissions (IOSCO, 2022), which found that corporate bond markets became critical alternative

sources of long-term finance during periods of financial stress. The result also aligns with the FMDQ Group (2024), which concluded that deeper corporate bond markets promote productive investment and strengthen economic resilience. It also aligns with the findings of DMO (2022), which highlighted the growing role of corporate bonds in financing business expansion and productive activities. Similarly, the result supports Anderson and Eriksson (2023), who found that liquid corporate bond markets improve capital allocation and enhance long-run economic growth.

The findings on manufacturing investment only partially support previous empirical evidence. While the short-run estimates indicate that both positive and negative shocks to manufacturing investment significantly affect economic growth, the long-run coefficients are statistically insignificant. This outcome differs from the findings of Ihenyen et al. (2024) and John et al. (2025), who reported that manufacturing activities contribute positively to Nigeria's economic growth over the long run. A plausible explanation is that this study measures manufacturing investment within an asymmetric NARDL framework, which distinguishes between positive and negative investment shocks rather than estimating only average linear effects. The insignificant long-run coefficients may therefore reflect persistent structural constraints within Nigeria's manufacturing sector-including inadequate infrastructure, unreliable power supply, weak technological capacity, limited industrial competitiveness, and financing bottlenecks which reduce the long-term growth impact of manufacturing investment despite its short-run importance.

The results on real interest rate partially agree with previous studies. The positive interest-rate shock is only marginally significant, whereas the negative shock is statistically insignificant in the long run. These results differ from Ademola et al. (2023) and Abdulkarim (2024), who found significant long-run effects of interest rates on economic growth using linear ARDL models. They also provide only limited support for Olasehinde et al. (2024), who reported that interest-rate volatility adversely affects economic growth. The divergence may arise because the NARDL specification captures asymmetric responses to interest-rate movements, indicating that increases and decreases in real interest rates do not affect economic activity equally. The findings further suggest that weaknesses in Nigeria's monetary policy transmission mechanism may reduce the responsiveness of investment and output to changes in real interest rates, which suggests that structural factors may be more influential than borrowing costs in driving long-run economic growth.

Overall, the empirical evidence indicates that corporate bond financing exerts the strongest and most robust long-run influence on economic growth among the variables considered. This finding directly addresses the empirical gap identified in the literature, where previous Nigerian studies focused mostly on aggregate private investment or manufacturing performance without explicitly examining corporate bond financing within a unified framework. By jointly analyzing corporate bond financing, manufacturing investment, and real interest

rates using the NARDL approach, the study demonstrates that deepening the corporate bond market may yield greater long-run growth benefits than relying solely on manufacturing investment or conventional monetary policy measures. These findings therefore extend the existing literature by providing new evidence on the asymmetric role of corporate bond financing in promoting sustainable economic growth in Nigeria.

5. Conclusion and Policy Recommendations

This study finds that corporate bond investment is the most potent long-run driver of economic growth in Nigeria, with positive shocks raising GDP and negative shocks causing disproportionately larger contractions. Manufacturing investment provides only short-run support due to persistent structural constraints, while real interest rates have weak effects, indicating poor monetary transmission. The findings suggest that deepening Nigeria's corporate bond market, alongside targeted reforms to improve manufacturing productivity and reduce borrowing costs, offers the most viable path to sustainable growth. Policymakers should prioritize regulatory reforms, market liquidity, and investor confidence to unlock the growth potential of bond-financed industrial investment. Accordingly, the study recommends that:

i. Corporate Bond Investment (CRBI): The federal government and other policymakers should deepen Nigeria's corporate bond market by introducing targeted tax incentives for bond issuance, reducing issuance costs, strengthening credit enhancement mechanisms, and encouraging greater participation of institutional investors such as pension funds and insurance companies. These measures would encourage inter-corporate linkages from bonds sub-sector to other sub-sectors of the private investment, and long-term financing for sustained economic growth.

ii. Manufacturing Investment (PMII): The federal government of Nigeria should strengthen manufacturing investments through improved infrastructure, enforce friendly fiscal policies, and easy access to long-term finance for firms undertaking productive capital investments. This will promote industrial productivity and expand the production capacity for economic growth.

iii. Real Interest Rate (RINT): The monetary authority (CBN) should realistically embark on measures that will reduce and stabilize real interest rates strategically. If the cost of borrowing is reduced, it will stimulate investments and consumption, particularly in the productive sectors such as manufacturing, real estate, small and medium scale enterprises, and agriculture. The CBN should also reduce risk premium via credit rating agencies and collateral registry, not just CBN's monetary policy rate. This will encourage more private investment in the economy.

Limitations of the Study

i. Although variables such as oil prices, infrastructure quality and exchange rate movements may influence both manufacturing investment and economic growth, they were excluded to preserve model parsimony and because the study focuses specifically on the financing role of corporate bond investment. These omitted variables are expected to be included in the model by another researcher to see how they add to influence economic growth in the economy.

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