

Collateral Requirements and Corporate Investment: Evidence from Nigerian Listed Firms (2015–2025)

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Abstract

This study investigates the effect of collateral requirements on corporate investment decisions among non-financial firms quoted on the Nigerian Exchange Group over the period 2015–2025. Using a balanced panel dataset of 60 firms comprising 660 firm-year observations, the study applied a fixed effects regression model to analyze the association between collateral intensity and corporate investment while controlling for firm size, profitability, leverage, and macroeconomic conditions.

The empirical findings reveal that collateral intensity exercises a negative and statistically significant result on corporate investment, indicating that stringent collateral requirements constrain firms' access to external funding and limit investment activities. In contrast, firm size and profitability are found to positively influence investment, suggesting that larger and more financially robust firms are better positioned to undertake capital expenditures. Leverage shows a negative association with investment, consistent with the leverage overhang hypothesis, whereas economic growth positively drives investment behavior. The results support the credit rationing theory and the financial constraints framework, emphasizing the role of lending conditions in determining corporate investment decisions. The study recommends policy reforms aimed at improving credit accessibility, strengthening credit information systems, and reducing excessive collateral constraints to stimulate private sector investment and economic growth in Nigeria.

Keywords: *Corporate investment, collateral requirements, financial constraints, panel data, Nigeria.*

1. Introduction

Corporate investment is a primary determinant of economic growth, enhancing productivity, and fostering technological advancement. Through investment in capital assets, firms expand their productive capacity, improve operational efficiency, and strengthen competitiveness. This is particularly important in developing economies such as Nigeria, where private sector investment is a key driver of employment generation and structural transformation.

Despite its importance, access to external funding remains a foremost limitation for firms operating in emerging markets. Financial institutions often impose stringent lending conditions to mitigate credit risk arising from information asymmetry between lenders and borrowers. One of the most prominent conditions is the requirement for collateral, whereby firms must pledge

tangible assets as security for loans. While collateral serves as a risk management tool that enhances loan recovery and reduces default probability, excessive collateral requirements may restrict access to credit and consequently hinder firms' investment activities (Beck and Demirgüç-Kunt, 2006).

The theoretical foundation for this argument is rooted in the credit rationing model, which posits that under conditions of asymmetric information, lenders may prefer to limit the supply of credit rather than increase interest rates. In such circumstances, collateral requirements function as a screening mechanism but may simultaneously exclude potentially viable firms that lack sufficient assets (Stiglitz and Weiss (1981)). Similarly, the financial constraints framework suggests that firms facing limited access to external finance tend to underinvest, even when profitable investment opportunities exist. (Fazzari, Hubbard and Petersen, 1988) Although a considerable amount of literature has studied the connection between financial constraints and corporate investment, insufficient attention has been given to the specific role of collateral requirements in shaping investment decisions, particularly in the Nigerian context. Existing studies often focus broadly on credit availability without isolating collateral intensity as a distinct determinant of investment behavior.

This research addresses this gap by empirically probing the impact of collateral requirements on corporate investment among quoted non-financial firms on the Nigerian Exchange Group over the period 2015–2025. By incorporating firm-specific characteristics and macroeconomic conditions within a panel data framework, the study offers a wide-ranging analysis of how collateral constraints impact investment decisions in an emerging market setting

1.1 Statement of the Problem

Access to finance remains a persistent challenge for firms in developing economies, particularly in Nigeria, where the financial system is characterized by high lending risk and weak credit information infrastructure. Commercial banks often rely heavily on collateral-based lending practices, requiring firms to pledge substantial assets before credit is extended. While such practices are intended to reduce default risk, they may have unintended consequences. Firms with limited tangible assets despite having viable investment opportunities may be excluded from accessing credit. This creates a situation where potentially productive investments are not undertaken, thereby constraining firm growth and overall economic development.

Although prior studies have examined credit constraints broadly, there is limited empirical proof on the specific impact of collateral intensity on corporate investment in Nigeria. This lack of focused analysis restricts the ability of policymakers and financial institutions to design effective credit policies.

Accordingly, this study investigates whether collateral requirements constitute a binding constraint on corporate investment decisions among Nigerian non-financial firms.

1.2 Objectives of the Study

The study core objective is to analyze the influence of collateral requirements on corporate investment decisions among Nigerian Exchange Group quoted non-financial firms. Precisely, the research seeks to:

- Assess the association between collateral intensity and corporate investment levels in Nigerian non-financial firms.
- Investigate the influence of firm-specific features (like size, leverage, profitability, and liquidity) on the responsiveness of investment to collateral requirements.

- Determine the extent to which collateral requirements act as a binding constraint on corporate investment in the Nigerian financial environment.

2. Review of Related Literature

Understanding the determinants of corporate investment has extensively been a central apprehension in corporate finance and development economics. Investment decisions are driven by both internal firm characteristics and external financial market conditions, which access to finance is often cited as a binding constraint for firms, particularly in emerging markets like Nigeria (Fazzari, Hubbard and Petersen, 1988; Ayyagari, Demirgüç-Kunt and Maksimovic, 2011). This literature review synthesizes relevant theoretical and empirical insights on collateral requirements, corporate investment behavior, and the mechanisms through which financial constraints influence firm investment.

2.1. Collateral Requirements and Corporate Investment

Collateral plays a central role in credit markets by mitigating lending risk and addressing information asymmetry between borrowers and lenders. According to the credit rationing framework, lenders may impose collateral requirements as a mechanism for screening borrowers and reducing adverse selection. However, while collateral enhances loan security, excessive reliance on it may restrict credit access, particularly for firms with limited tangible assets.

Empirical evidence suggests that stringent collateral requirements can negatively affect firm investment. Studies have shown that in environments with underdeveloped financial systems, firms facing high collateral demands are less likely to obtain external financing, leading to reduced investment and slower growth. Furthermore, firms operating under such constraints tend to rely more heavily on internal funds, which may be insufficient to support optimal investment levels. (Love and Martínez Pería 2019, Odio, Ogbulu, and Akpannah(2021)

In the Nigerian context, existing research indicates that collateral requirements remain a significant barrier to access to credit, particularly for small and medium-sized enterprises. This suggests that collateral intensity may act as a binding constraint on investment, reinforcing the relevance of examining its direct impact on corporate investment decisions (Adewoye, and Oluwatobi 2022)

2.2 Firm Characteristics and Investment Decisions

Firm-specific characteristics act a vital role in determining investment capacity. Firm size, for instance, is often associated with better access to credit markets due to greater asset diversification, established reputations, and stronger relationships with financial institutions. Larger companies are therefore less probable to face binding financial constraints.

Profitability is another key determinant of investment, as it echoes the accessibility of internal funds. According to the theory pecking order, firms opt for internal funding above outside borrowing owing to lower transaction costs and reduced information asymmetry. Consequently, more profitable firms are better positioned to undertake investment without relying heavily on external finance Odio, Ogbulu, and Akpannah 2021)

2.3 Financial Leverage and Investment Behavior

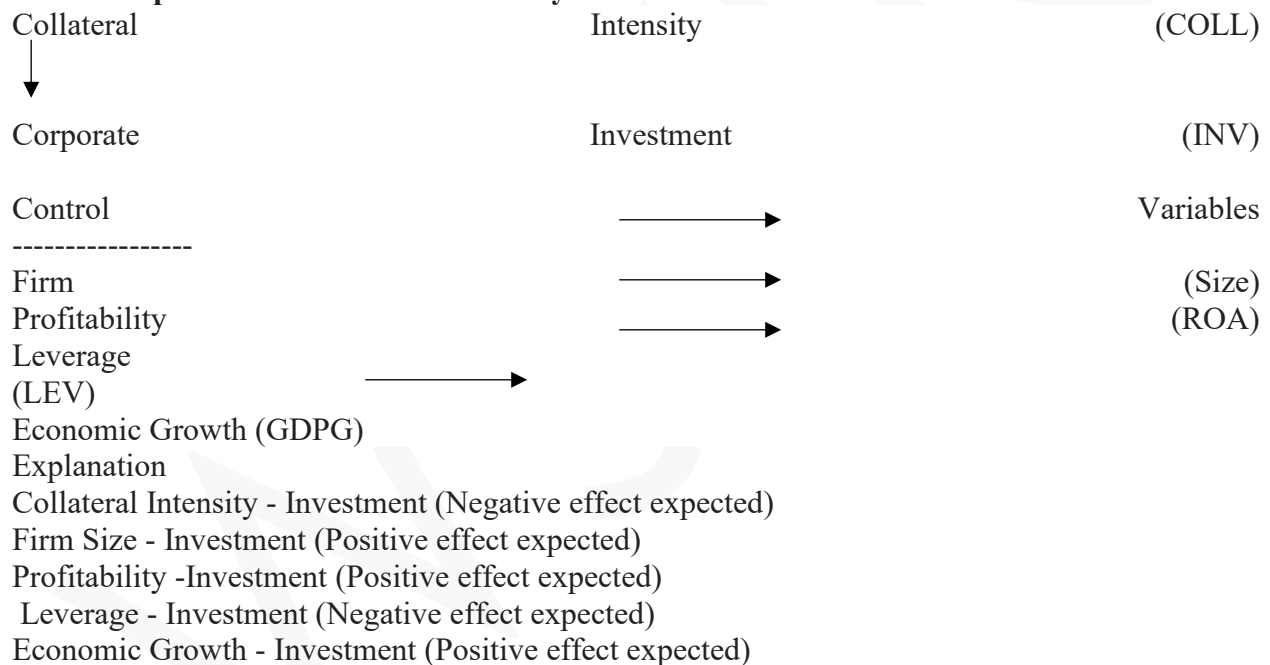
Leverage represents a double-edged relationship in corporate finance. While moderate leverage can signal creditworthiness, extremely high leverage might limit a firm's capacity to secure additional financing. Zhang (2019) finds that highly leveraged firms experience a "debt

overhang” problem, where high debt servicing obligations discourage new investment because returns may accrue more to creditors than to equity holders. In emerging economies, this problem is often intensified. Odio et al. (2021) argued that extremely leveraged Nigerian firms are more probable to experience credit rationing due to risk aversion by lenders. Egbide and Anowa (2023) further stress that leverage significantly diminishes investment capacity in Nigerian firms, implying that high leverage intensifies financial constraints.

2.4 Macroeconomic Conditions and Investment

Macroeconomic factors such as economic growth influence firms’ investment decisions. Positive economic growth signals higher expected returns and encourages investment expansion. Gao, Harford, and Li (2020) find that favorable macroeconomic environments increase firms’ investment activities by improving credit availability and reducing risk perceptions. Conversely, economic instability can heighten risk and tighten lending conditions, thereby reducing investment.

2.5. Conceptual Framework of the Study



2.6. Theoretical Framework of the Study

The theoretical foundation of this study is grounded on the credit market framework developed by Stiglitz and Weiss. (1981) Their model explains how asymmetric information in lending markets may lead financial institutions to ration credit rather than simply increase interest rates. In such circumstances, collateral requirements become an important screening mechanism that determines firms’ access to external financing.

2.6.1 Financial Constraints Theory

The Financial Constraints Theory postulates that firms often experience restrictions in accessing external funding due to limitations in capital markets. Even when profitable investment opportunities exist, firms may underinvest if they cannot secure adequate funding (Fazzari,

Hubbard and Petersen, 1988; Almeida, Campello and Weisbach, 2011). According to this theory: Companies with higher internal resources (profits, retained earnings) are less constrained and can invest more. Firms depending heavily on external funding may be constrained if banks impose stringent lending conditions, including high collateral requirements. In the Nigerian setting, where capital markets are shallow and SMEs dominate, financial restraints are predominantly binding. High collateral requirements worsen these constraints, dipping firms' ability to assume profitable investments (Odio, Ogbulu and Akpannah, 2021)

2.6.2 Credit Rationing Theory

Stiglitz and Weiss (1981) documented the Credit Rationing Theory, which describes how information asymmetric between lenders and borrowers can lead banks to reduce the supply of credit, even at higher interest rates. Financial institutions employ collateral as a mechanism to decrease default risk, but: extreme collateral demands may eliminate creditworthy firms that cannot meet the demands. Firms with inadequate collateral may experience investment deficits, resulting to underinvestment despite having feasible projects. This theory is primarily applicable for Nigeria, where many firms, especially SMEs, lack adequate tangible assets to meet banks' collateral thresholds. Therefore, collateral-dependent lending can significantly impact corporate investment decisions

2.7. Hypotheses

Grounded on our theoretical background, the resulting hypotheses are developed

H1: Collateral requirements have a significant impact on corporate investment.

H2: Firm size has a positive impact on corporate investment.

H3: Profitability has a positive impact on corporate investment

H4: Leverage has a negative impact on corporate investment.

2.8. Review of Empirical Literature

A growing body of empirical research has studied the determining factor of corporate investment and the function of credit constraints and collateral requirements in emerging and developing economies. The following researches provide relevant evidence and context for the current research.

Beck, Klapper, and Mendoza (2019) studied collateral requirements and investment behavior by analyzed partial credit guarantee programs in over 100 countries. The study, found that collateral requirements significantly affect firm financing behavior, especially for smaller and medium enterprises. Their study showed that excessive collateral demand reduces firms' ability to undertake investment and growth activities, particularly in economies with weak credit information systems.

Equally, Beck and Demirguc-Kunt (2006) investigated access to funding for small and medium enterprises in 80 countries and found that firms facing stringent collateral demands are less expected to obtain bank credit, resulting to lower investment activity and slower growth.

Love and Martínez Pería (2019) conducted a cross-country investigation of firms' access to credit and found that in countries with high collateral intensity, firms depend more on internal funds, which limits investment opportunities when internal resources are inadequate.

Using African firm-level data, Odio, Ogbulu, and Akpannah (2021) recognized that collateral demands and weak application of creditor rights significantly constrain SME growth and investment in Nigeria. Their findings corroborate the view that collateral requirements are a

binding constraint on investment.

Agunbiade, Adewoye, and Oluwatobi (2022). conducted a study on Bank credit and corporate investment dynamics using Nigerian non-financial firms, they found that firm funding conditions as well as collateral policies significantly influenced investment decisions. The study also highlighted the interaction between profitability and collateral intensity, noting that more profitable firms are less constrained by collateral demands.

Egbide and Anowa (2023) studied the effect of access to bank credit on the financial performance of Nigerian firms and found a positive association between access to credit and investment results. However, firms with limited collateral tended to have lower credit access, supporting the hypothesis that collateral requirements shape financing conditions and investment behavior.

Zhang (2019) studied capital structure dynamics in emerging markets. The study found that high leverage levels often connected with stringent borrowing conditions reduce subsequent investment in productive assets. Although not focused exclusively on collateral, the study reflects how risk management practices by lenders affect firm investment.

Gao, Harford, and Li (2020) analyzed corporate cash policy and investment behavior using global firm data. The study concluded that external financing frictions including credit conditions act a vital role in determining investment decisions, particularly in periods of economic uncertainty.

Summary of Literature Gaps

Although previous studies have examined financial constraints and corporate investment, limited study has specifically focused on the role of collateral requirements in shaping corporate investment behavior in Nigeria. Many existing studies examine credit access broadly without isolating collateral intensity as a key determinant of investment decisions. In addition, relatively few studies use firm-level panel data covering recent periods of economic change. This research addresses these gaps by probing the impact of collateral intensity on corporate investment among non-financial firms listed on the Nigerian Exchange Group over the period 2015–2025. The study also incorporates firm characteristics and macroeconomic conditions within a unified empirical framework.

3. Methodology

3.1 Research Design

In this study, a quantitative procedure is used explore how collateral requirements influence corporate investment decisions among firms in Nigeria. A panel data research design is employed since it enables the analysis of both cross-sectional and time-series data simultaneously. This method enhances the reliability of empirical outcomes by capturing disparities among companies in addition to changes over time. The panel structure also makes it possible to adjust for unobserved firm-specific characteristics that may impact investment decisions but remain constant over time. The study covers the period 2015 to 2025, which provides sufficient observations to analyze trends in corporate investment and lending conditions within the Nigerian financial environment

3.2. Population of the Study

The population of the study includes all quoted Nigerian Exchange Group (NGX) non-financial firms. These firms operate in various sectors of the Nigerian economy, including manufacturing,

consumer goods, industrial goods, oil and gas, healthcare, and agriculture. Financial institutions such as banks, insurance firms, and other financial service providers were excluded from the study. This exclusion is necessary because financial firms operate under different regulatory frameworks and possess unique capital structures that are not directly comparable with those of non-financial firms. By focusing on non-financial firms, the study ensures a more consistent analysis of corporate investment behavior. As of 2024, the Nigerian Exchange Group lists over 150 companies across different sectors, of which approximately 110 are non-financial firms

3.3. Sampling Technique

The study employs a purposive sampling method to choose firms that meet specific measures relevant to the objectives of the research. The population includes all non-financial firms listed on the Nigerian Exchange Group. Financial institutions such as banks, insurance companies, and other financial service firms were excepted since they function under different regulatory and capital structure frameworks. The sample selection followed several criteria. First, the firm must be classified as a non-financial company quoted on the exchange. Second, the firm must have complete and accessible financial data for the whole study period from 2015 to 2025. Third, the firm must have remained actively listed during the period under consideration in order to guarantee data reliability. Fourth, the company must publish yearly financial statements containing the information required to compute the variables used in the study. After applying these criteria, a total of 60 firms were selected. The final dataset therefore includes a balanced panel of 660 firm-year observations (60 firms observed over eleven years). The use of a balanced panel helps improve the reliability of the empirical analysis by minimizing missing observations and ensuring consistency across time. The use of firm-level panel data enables the analysis to control for unobserved heterogeneity across firms and improves the efficiency of the econometric assessment

3.4. Sources of Data

The study depends completely on secondary data gotten from reliable and overtly available sources. Firm-level financial data were collected from the yearly reports and financial statements of the carefully chosen firms. Additional firm information was obtained from the database of the Nigerian Exchange Group. Macroeconomic data, particularly the rate of yearly growth of gross domestic product, were obtained from the databases of the World Bank and the statistical publications of the Central Bank of Nigeria. These sources are widely used in empirical research and provide reliable financial and macroeconomic data for analyzing corporate investment behavior

3.5. Variable Measurement

The variables applied in this research are demarcated based on generally accepted measures in corporate finance literature

Variable	Measurement
Corporate Investment (INV)	$\text{Capital expenditure} \div \text{Total assets}$
Collateral Intensity (COLL)	$\text{Tangible assets} \div \text{Total assets}$
Firm Size (SIZE)	Natural log of total assets
Profitability (ROA)	$\text{Net income} \div \text{Total assets}$
Leverage (LEV)	$\text{Total debt} \div \text{Total assets}$

Variable	Measurement
Economic Growth (GDPG)	Annual GDP growth rate

Corporate investment serves as the dependent variable, while collateral intensity represents the main explanatory variable. Firm size, profitability, leverage, and economic growth are added as control variables to explain other factors that may impact investment decisions. Collateral intensity is measured as the percentage of tangible assets to total assets. This variable serves as a representation for the percentage of firm assets that can be pledged as security when obtaining bank financing. Firms with a larger percentage of tangible assets are generally considered more capable of meeting collateral requirements imposed by financial institutions

3.6 Model Specification

To explore the association within collateral requirements and corporate investment, the study specifies the following panel regression model:

$$INV_it = \beta_0 + \beta_1 COLL_it + \beta_2 SIZE_it + \beta_3 ROA_it + \beta_4 LEV_it + \beta_5 GDPG_t + \mu_i + \varepsilon_it$$

Where:

INV represents corporate investment for firm i at time t

COLL represents collateral intensity

SIZE represents firm size

ROA represents profitability

LEV represents leverage

GDPG represents the rate of economic growth

μ_i captures firm-specific effects that do not change over time

ε_it represents the random error term

This model allows the study to evaluate the extent to which collateral requirements influence corporate investment while controlling for both firm characteristics and macroeconomic conditions

3.7. Estimation Technique

This research applied a panel data estimation method in order to evaluate the association between collateral requirements and corporate investment decisions. Panel data methods are mostly apt because they merge cross-sectional and time-series information, thereby allowing the analysis to capture both firm-specific differences and temporal variations. The empirical model is estimated employing the fixed effects assessment, which controls for unnoticed firm characteristics that remain constant in the long run but may influence investment behavior. To guarantee the strength of the results, some diagnostic tests were carried out. These include: the Hausman test to establish if the fixed effects model is more apt than the random effects model; the Breusch–Pagan test to spot the existence of heteroskedasticity; the Variance Inflation Factor (VIF) test to examine multicollinearity among descriptive variables; and the Wooldridge test to check for serial correlation in the panel data. These procedures help ensure that the estimated results are reliable and that the conclusions drawn from the analysis are statistically valid

3.8. Endogeneity Consideration

To address potential endogeneity concerns between collateral intensity and corporate investment, the research applied firm fixed effects to account for unobserved time-invariant firm characteristics that may influence both borrowing capacity and investment decisions. Additionally, macroeconomic conditions are incorporated to account for external factors

affecting credit availability. While reverse causality may be present between investment and asset accumulation, the panel structure of the data helps mitigate this concern by exploiting variations across firms and over time. Future studies may extend this analysis using dynamic panel estimators such as the Generalized Method of Moments (GMM)

4. Results Presentation and Analysis

This segment presents and discusses the empirical outcomes obtained from the panel data analysis. The analysis proceeds in several stages. First, descriptive statistics are presented to provide an overview of the characteristics of the variables employed in the study. Second, a correlation matrix is examined to evaluate the relationships among the variables and detect potential multicollinearity problems. Third, the main regression results from the fixed effects model are presented and interpreted. Lastly, robustness checks are carried out to establish the reliability of the empirical findings.

4.1 Descriptive Statistics

Descriptive statistics offer a synopsis of the distribution and basic characteristics of the variables included in the analysis. These statistics include the mean, median, minimum and maximum values, in addition to the standard deviation.

Table 4.1: Descriptive Statistics of Study Variables (2015–2025)

Variable	Mean	Median	Maximum	Minimum	Std. Dev.	Observations
INV	0.1213	0.1180	0.2734	0.0121	0.0652	660
COLL	0.4321	0.4410	0.7852	0.0417	0.1583	660
SIZE	15.764	15.701	19.302	12.804	1.392	660
ROA	0.0789	0.0743	0.2102	-0.0195	0.0481	660
LEV	0.5468	0.5520	0.9197	0.1213	0.1894	660
GDPG	0.0187	0.0210	0.0880	-0.0600	0.0342	660

Source: Author's Computation (2026)

The descriptive statistics show that the average corporate investment ratio (INV) is 0.1213, indicating that firms invest approximately 12.13 % of their entire assets in capital expenditures annually. The mean value of collateral intensity (COLL) is 0.4321, suggesting that tangible assets represent about 43 percent of total assets on average. This implies that a substantial number of firms' assets can potentially be used as collateral for borrowing. Firm size (SIZE), gauged as the natural logarithm of total assets, has a mean value of 15.764, indicating moderate variation in firm scale across the sampled companies. Profitability (ROA) has an average worth of 0.0789, suggesting that firms earn an average return on assets of approximately 7.89 percent. Financial leverage (LEV) has a mean value of 0.5468, indicating that more than half of the firms' assets are financed through debt. The GDP growth rate (GDPG) shows an average value of 0.0187, reflecting moderate economic growth throughout the study period. The presence of both positive and negative values indicates fluctuations in Nigeria's macroeconomic environment over time.

4.2 Correlation Analysis

Correlation analysis is carried out to examine the level of association among the variables and to detect possible multicollinearity issues

Table 4. 2: Correlation Matrix of Study

Variables	INV	COLL	SIZE	ROA	LEV	GDPG
INV	1.000					
COLL	-0.382	1.000				
SIZE	0.243	0.116	1.000			
ROA	0.336	-0.152	0.218	1.000		
LEV	-0.269	0.182	-0.109	-0.193	1.000	
GDPG	0.209	0.087	0.072	0.118	-0.041	1.000

Source: Author's Computation (2026)

The correlation matrix reveals several important relationships. Collateral intensity (COLL) is negatively correlated with corporate investment (INV), suggesting that firms with higher collateral intensity tend to invest less. Firm size (SIZE) and profitability (ROA) are positively correlated with investment, indicating that larger and more profitable firms are more likely to undertake investment activities. Leverage (LEV) exhibits a negative relationship with investment, implying that firms with higher debt levels tend to reduce their investment activities. The correlation between GDP growth and investment is positive, indicating that favorable macroeconomic conditions stimulate corporate investment. Significantly, none of the correlation coefficients exceed 0.80, demonstrating that multicollinearity is improbable to be a significant worry in the regression analysis

4.3 Fixed Effects Regression Results

The main empirical analysis is conducted using a fixed effects panel regression model. The fixed effects estimator is appropriate since it accounts for unobserved firm-specific characteristics that remain constant at the long run but may influence investment decisions

Dependent Variable: Corporate Investment (INV)

Table 4.3: Variable	Coefficient	Std. Error	t-Statistic	Probability
Constant	0.0321	0.0150	2.14	0.032
COLL	-0.2053***	0.0454	-4.52	0.000
SIZE	0.0287***	0.0093	3.09	0.002
ROA	0.4984***	0.0992	5.02	0.000
LEV	-0.1682***	0.0573	-2.94	0.004
GDPG	0.0441**	0.0202	2.18	0.029

Source: Author's Computation (2026)

*** $p < 0.01$

** $p < 0.05$

• $p < 0.10$

The fixed effects regression results indicate that the coefficient of collateral intensity is negative and statistically significant ($\beta = -0.2053$, $p < 0.01$), demonstrating that firms with higher levels of collateralizable assets experience lower investment ratios. This result infers that the existence of collateralized assets may reflect existing borrowing commitments or restrictive lending practices that constrain additional investment. The finding supports the credit rationing framework proposed by Stiglitz and Weiss (1981). Firm size exhibits a positive and significant association with investment, implying that bigger firms tend to undertake more investment activities due to better access to financial resources. Profitability shows strong positive influence on investment, supporting the argument that internally generated funds play a significant role in financing corporate investment. Leverage is negatively associated with investment, suggesting that extremely leverage firms may reduce investment due to financial constraints and debt servicing obligations. Finally, GDP growth has a positive and significant influence on corporate investment, inferring that favorable macroeconomic conditions stimulate firm investment activities.

4.4: Model Summary Statistics

Statistic	Value
R-squared	0.417
Adjusted R-squared	0.361
S.E. of Regression	0.051
F-statistic	24.182
Prob(F-statistic)	0.000
Durbin-Watson	1.91

This table provides overall measures of model fit: R-squared = 0.417 about 42% of the variation in investment is described by the independent variables f- statistic = 24.182. $P < 0.01$. the model is statistically significant overall. Durbin-Watson 1.91 indicate no serious autocorrelation in residuals. this summary indicates that the model offers a reasonably appropriate fit and that the regression results are reliable

Discussion of Findings

The empirical findings of this study offer vital understandings into the role of financial constraints in shaping corporate investment behavior among Nigerian firms. First, the results show that collateral intensity has a negative and statistically substantial impact on corporate investment. This finding supports the credit rationing theory developed by Joseph Stiglitz and Andrew Weiss, which suggests that lenders rely on collateral as a mechanism to manage lending risk under conditions of information asymmetry (Stiglitz and Weiss, 1981). However, when collateral requirements become excessively stringent, they may limit firms' access to credit and reduce their ability to undertake productive investments. This result is consistent with prior research that documented a negative association between collateral constraints and firm investment (Beck and Demirgüç-Kunt, 2006). Second, firm size exhibits a positive and significant association with corporate investment. Bigger firms naturally have better access to financial resources and robust relationship with financial institutions, enabling them to finance investment projects more easily (Love and Martínez Peria, 2019). Third, profitability shows a strong positive effect on investment, indicating that firms rely heavily on in-house generated

finance to fund investment activities. This result supports the pecking order theory proposed by Stewart Myers and Nicolas Majluf, which suggests that firms favor in-house funding over external borrowing owing to asymmetry of information and transaction costs (Myers and Majluf, 1984). Finally, leverage is negatively associated with corporate investment, supporting the debt overhang hypothesis which argues that highly leveraged firms may reduce investment due to the burden of debt servicing obligations (Myers, 1977)

4.4 Robustness Check

To validate the stability of the empirical outcomes, robustness tests were conducted using alternative estimation techniques and robust standard errors. To certify the fidelity of the empirical results, some robustness checks were carried out. These tests help verify that the findings are not driven by model specification or econometric issues. First, the Hausman specification test was performed to verify whether the fixed-effects or random-effects model was more suitable. The test results suggest that the fixed-effects model is ideal, confirming that unobserved firm-specific characteristics are correlated with the explanatory variables. Second, a multicollinearity test was carried out employing the Variance Inflation Factor (VIF). The VIF values for all explanatory variables were significantly under the standard benchmark of 10, demonstrating that multicollinearity is not an issue in the model. Third, a heteroskedasticity test was performed to investigate the existence of unequal error variances. The results indicate mild heteroskedasticity; therefore, robust standard errors were employed to obtain consistent estimates. The Nigerian financial system is characterized by relatively high lending risk and limited credit information infrastructure. As a result, commercial banks often rely heavily on collateral-based lending practices to mitigate default risk. In such an environment, firms with limited tangible assets may experience significant financing constraints despite possessing profitable investment opportunities. The findings of this study therefore reflect structural features of the Nigerian credit market, where strict collateral requirements remain a dominant screening mechanism for bank lending. Finally, an alternative model specification was estimated by excluding certain control variables. The results remained largely aligned with the baseline model, confirming the stability and robustness of the empirical findings.

Table 4.5. Robustness Check Regression

Dependent Variable: Corporate Investment (INV)

Estimation Method: Panel Least Squares with Robust Standard Errors

Variable Coefficient Robust Std. Error t-Statistic p-value

Constant	0.0318	0.0149	2.13	0.034
COLL	-0.1987***	0.0471	-4.22	0.000
SIZE	0.0294***	0.0091	3.22	0.001
ROA	0.4852***	0.1024	4.74	0.000
LEV	-0.1625***	0.0591	-2.75	0.006
GDPG	0.0416*	0.0214	1.94	0.052

Source: Author's Computation (2026)

INV = Corporate Investment (Capital Expenditure / Total Assets) COLL = Collateral Intensity (Tangible Assets / Total Assets) SIZE = Natural Logarithm of Total Assets ROA = Return on Assets (Net Income / Total Assets) LEV = Leverage (Total Debt / Total Assets) GDPG = Annual GDP Growth Rate

Significance Levels

*** $p < 0.01$ (1% level)

** $p < 0.05$ (5% level)

○ $p < 0.10$ (10% level)

The robustness regression confirms the findings of the baseline fixed effects model. Collateral intensity remains negative and statistically significant, indicating that higher collateral requirements constrain corporate investment. Firm size and profitability maintain positive and significant relationships with investment, suggesting that larger and more profitable firms have greater capacity to finance investment activities. Leverage continues to exhibit a negative and statistically significant effect, supporting the debt overhang hypothesis. GDP growth retains a positive effect on corporate investment and remains marginally significant at the 10 percent level, indicating that favorable macroeconomic conditions contribute to increased investment activity.

These robustness checks provide confidence that the main results are not sensitive to alternative model specifications or econometric problems.

Test	Statistic	Prob.	Interpretation
Hausman Test (FE vs RE)	18.62	0.002	FE preferred
Breusch-Pagan (Heteroskedasticity)	$\chi^2 = 24.35$	0.015	Minor heteroskedasticity; use robust SE
VIF (Multicollinearity)	COLL=1.12, ROA=1.14, GDPG=1.02	SIZE=1.05, LEV=1.08,	Multicollinearity not an issue

Serial Correlation Test

Serial correlation occurs when the error terms are correlated across time. In panel data models, this can bias the standard errors and affect the reliability of the estimates. The Wooldridge test for autocorrelation in panel data was used

Serial Correlation Test (Wooldridge Test)

Statistic Probability

1.72 0.196

The probability value of 0.196 is greater than 0.05, indicating that the null hypothesis of no serial correlation cannot be rejected. Thus, serial correlation is not present in the model to ensure the fidelity of the empirical outcomes, robustness checks were carried out by re-estimating the model using alternate specifications. Precisely, the Random Effects model was estimated and compared with the Fixed Effects model.

Random Effects Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Probability
COLL	-0.212	0.061	-3.48	0.001
SIZE	0.074	0.029	2.55	0.012
ROA	0.315	0.109	2.89	0.005
LEV	-0.164	0.072	-2.28	0.024

Variable Coefficient Std. Error t-Statistic Probability

GDPG 0.083 0.041 2.02 0.045

The results from the Random Effects model align with the Fixed Effects model. Collateral requirements continue to exhibit a negative and statistically significant association with corporate investment, confirming the robustness of the findings. Firm size and profitability maintain positive relationships with investment, whereas leverage remains negatively associated with investment.

Conclusion

This study investigated the effect of collateral requirements on corporate investment decisions among the Nigerian Exchange Group quoted non-financial firms over the period 2015–2025. Using firm-level panel data and a fixed effects regression model, the study provides empirical evidence that collateral intensity has a negative and statistically significant impact on corporate investment. This outcome infers that stringent collateral requirements imposed by financial institutions may constrain companies' access to external finance and limit their capacity to undertake productive investment projects. The outcome as well disclose that firm size and profitability positively influence corporate investment, indicating that larger and more profitable firms are better positioned to finance investment activities. Conversely, leverage is found to have a negative effect on investment, supporting the debt overhang hypothesis that extremely leveraged firms may lower investment owing to financial obligations. In addition, economic growth positively influences corporate investment, highlighting the importance of a stable macroeconomic environment in supporting business expansion.

Policy Implications

The results of this research provide important inferences for financial sector policy and corporate financing in Nigeria. First, the negative relationship between collateral intensity and corporate investment suggests that stringent collateral requirements may restrict firms' access to credit. Financial institutions should therefore adopt more flexible collateral frameworks that consider alternative forms of security such as movable assets and receivables. Second, policymakers should strengthen credit infrastructure by improving the effectiveness of credit information systems and expanding the coverage of credit bureaus. Enhanced information transparency can reduce asymmetry of information between lenders and borrowers and reduce excessive collateral requirements. Third, the government should expand credit guarantee schemes that reduce lending risks for financial institutions while facilitating access to credit for firms with limited collateral. Such programs can stimulate investment and support industrial growth. Finally, macroeconomic stability remains critical for investment growth. Policies that promote stable economic growth, moderate inflation, and predictable exchange rates can improve business confidence and encourage long-term corporate investment.

Contribution to Knowledge

This study adds to the corporate finance and development finance literature in different ways. First, it provides current empirical evidence on the relationship between collateral requirements and corporate investment in Nigeria using firm-level panel data covering the period 2015–2025. Second, unlike many previous studies that examine credit availability broadly, this study isolates collateral intensity as a specific mechanism through which financial constraints influence

investment decisions. Third, the study integrates firm-level characteristics and macroeconomic conditions within a unified empirical framework, thereby offering a more comprehensive understanding of investment behavior in emerging market environments

Recommendations

Adopt flexible collateral policies to improve firms' access to credit

- Strengthen credit information systems to reduce information asymmetry.
- Expand credit guarantee programs to support lending to firms with limited collateral.
- Encourage internal financing by improving profitability.
- Promote prudent debt management to avoid debt overhang effects

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