EFFICIENCY RATIOS AND LONG-TERM CORPORATE INVESTMENT DECISIONS IN SELECTED LISTED DEPOSIT MONEY BANKS (DMBS) IN NIGERIA

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Abstract

The ability of banks to sustain long-term investment is critical for financial sector stability and economic growth, especially in emerging markets like Nigeria. Despite regulatory reforms and oversight, inconsistencies persist in the capital expenditure patterns of Nigerian Deposit Money Banks (DMBs), raising questions about the internal drivers of such investment decisions. Specifically, it remains unclear whether operational efficiency and financial leverage meaningfully influence banks' commitment to long-term investments. This study examines the impact of internal operational efficiency and financial leverage on long-term corporate investment decisions in selected listed DMBs in Nigeria from 2014 to 2024. Using capital expenditure intensity as a proxy for long-term investment, the study analyzes how two efficiency metrics: Revenue-to-Assets ratio (RTA) and Cost-to-Income ratio (CIR) affect investment decisions, with leverage (Debt-to-Equity ratio) serving as a control variable. Adopting a fixed effects panel regression model, the analysis reveals that RTA has a positive and statistically significant effect on CAPEX Intensity ($\beta = 0.3618$, $p < 0.01$), while CIR negatively influences CAPEX Intensity ($\beta = -0.2175$, $p < 0.05$). Leverage exhibits an insignificant negative effect ($\beta = -0.0125$, $p = 0.1489$). The model explains 61.7% of the variance in CAPEX Intensity ($R^2 = 0.617$). Findings highlight that internal efficiency, not financial structure, is a stronger predictor of long-term investment among Nigerian banks. The study recommends that DMBs focus on enhancing revenue productivity and reducing cost inefficiencies to boost sustainable investment, and encourages regulators to incentivize operational efficiency as a strategic lever for industry-wide growth and resilience.

Keywords: Capital Expenditure Intensity, Cost-to-Income Ratio, Nigerian Deposit Money Banks, Operational Efficiency, Revenue-to-Assets Ratio

1. Introduction

Long-term corporate investment decisions play a critical role in determining a firm's growth trajectory and sustainable competitive advantage. For Deposit Money Banks (DMBs) in Nigeria, these decisions often manifest in capital expenditures (CAPEX) directed toward digital infrastructure, branch expansion, compliance enhancement, and technological innovation areas crucial for maintaining financial stability and operational efficiency. As regulatory environments tighten and digital disruption becomes more pervasive, the need to understand the internal drivers of such long-term investments is more pressing than ever (Ahmed et al., 2021; Hu, Kong & Wang, 2022).

Among the internal organizational factors influencing investment behavior, operational efficiency, how well a firm utilizes its assets and manages costs has increasingly garnered attention in financial management literature. Two key indicators of efficiency, namely, the Revenue-to-Assets ratio (which measures asset utilization) and the Cost-to-Income ratio (indicative of operating efficiency), offer quantifiable insights into the extent to which firms deploy their resources in realizing financial objectives (Dang et al., 2023; Patin et al., 2020). Despite their intuitive importance, these metrics have rarely been empirically linked to actual capital expenditure decisions, particularly in the banking sector of developing economies like Nigeria.

While previous studies have focused on the effects of firm life cycle (Ahmed et al., 2021), financial constraints (Kim et al., 2024), credit ratings (Xiao & Yu, 2023), and managerial behavior on investment efficiency, the direct relationship between internal efficiency ratios and realized long-term investment decisions remains under-researched, especially when CAPEX is used as a proxy for long-term investment. Most existing studies conceptualize investment efficiency either through theoretical constructs (e.g., Tobin's Q, marginal q, etc.) or focus predominantly on Western or Asian markets (Gao & Yu, 2020; Gaio

et al., 2023), thus limiting generalizability to African banking contexts.

Furthermore, studies such as Lim and Mali (2018) suggest investor sentiment and market volatility are shaped by perceptions of firm-level efficiency supporting the notion that efficiency metrics carry significant signaling value. Efficient firms are viewed as stable and capable of generating predictable economic returns, which should theoretically empower them to pursue more ambitious long-term investment projects. However, whether this signaling effect translates into actual investment decisions remains empirically untested in Nigeria's banking sector.

In addition to efficiency metrics, a bank's financial leverage, commonly proxied by the Debt-to-Equity ratio, plays an ambiguous but still central role in investment decision-making. While higher leverage may signal access to external financing for growth, it may also impose debt-servicing constraints that crowd out long-term investments (Puspitasari & Muslim, 2023; Kim et al., 2024). Particularly in Nigeria, where macroeconomic volatility and fluctuating interest rates affect the cost of capital, the interplay between leverage and investment intensity assumes heightened relevance.

Against this background, this study responds to the need for a more empirically grounded understanding of how internal operational efficiency and capital structure interact to influence long-term investment spending in Nigeria's listed DMBs. It does so by examining the impact of Revenue-to-Assets ratio and Cost-to-Income ratio on CAPEX intensity, while accounting for leverage as a key control variable. By adopting an accounting-based approach that uses actual capital expenditure over average total assets as the dependent metric, this study offers a practical and context-specific contribution to ongoing discussions in corporate finance and banking strategy. Despite concerted efforts by regulatory bodies such as the Central Bank of Nigeria (CBN) and the Nigerian Deposit Insurance Corporation (NDIC) to strengthen the operational soundness of banks, there remains a notable inconsistency in long-term investment patterns among listed Deposit Money Banks (DMBs) in Nigeria. Some banks consistently increase their capital expenditure allocations year after year, while others exhibit stagnant or even declining investment intensity, regardless of their reported operational performance. This divergence raises a critical issue: the underlying drivers of long-term investment decisions in Nigerian banks are not well understood, particularly in relation to internal operational efficiency and financial leverage.

Previous research has largely focused on the impact of efficiency on profitability or market perception, with limited attention given to how efficiency ratios translate into tangible investment outcomes such as capital expenditure intensity. In the Nigerian banking sector, where regulatory pressures, rapid digital transformation, and liquidity constraints converge, this gap in understanding is even more pronounced. Without a clear linkage between internal efficiency measures and actual investment behavior, both practitioners and regulators lack the insights needed to guide strategic, long-term resource allocation.

Therefore, this study seeks to address the problem of unclear determinants of long-term corporate investment in Nigeria's listed DMBs by evaluating the extent to which internal operational efficiency and financial leverage inform capital expenditure decisions. Specifically, the study aims to: examine the relationship between asset utilization efficiency (as measured by the Revenue-to-Assets ratio) and long-term investment (proxied by CAPEX Intensity); investigate the effect of operating efficiency (measured by the Cost-to-Income ratio) on CAPEX Intensity; and assess how financial leverage (proxied by the Debt-to-Equity ratio) influences the relationship between efficiency indicators and capital expenditure intensity. By integrating these dimensions, the study provides a more nuanced and institution-specific understanding of the factors that drive long-term investment behavior in Nigerian banks.

2. Literature Review

2.1 Conceptual Review: Corporate Investment, Efficiency, and Efficiency Metrics

Corporate Investment

Corporate investment refers to the allocation of financial resources by firms toward assets or projects expected to generate future returns and enhance firm value (Lim & Mali, 2018; Rubio et al., 2018). These investments typically include capital expenditures (CAPEX) on property, plant, equipment, technology, and other long-term assets that support operational expansion and strategic objectives (Ahmed et al., 2021). The efficiency of corporate investment is often evaluated by how well these expenditures contribute to sustainable growth, profitability, and competitive advantage, while avoiding both overinvestment (which can lead to resource wastage) and underinvestment (which may hinder growth opportunities) (Hu, Kong, & Wang, 2022).

Efficiency in Corporate Context

Efficiency, in the context of corporate finance and operations, generally denotes the ability of a firm to maximize outputs or outcomes from a given set of inputs (Gao & Yu, 2020). Operational efficiency specifically refers to how effectively a company utilizes its resources such as assets, labor, and capital to generate revenue and control costs (Dang, Nguyen, & Dao, 2023). High operational efficiency implies that a firm can produce more with less, thereby improving profitability and freeing up resources for reinvestment. In banking, operational efficiency is particularly critical due to the sector's reliance on

prudent resource management and regulatory compliance (Lim & Mali, 2018).

Efficiency Metrics

Efficiency metrics are quantitative indicators used to assess how well a firm manages its resources in pursuit of its objectives. Two widely used efficiency ratios in the banking sector are the Revenue-to-Assets Ratio (RTA) and the Cost-to-Income Ratio (CIR) (Rubio et al., 2018; Dang, Nguyen, & Dao, 2023): These efficiency metrics are not only indicators of current performance but also serve as predictors of a firm's ability to sustain and expand its investment activities. Empirical studies have shown that banks with higher operational efficiency are more likely to undertake and sustain capital investments, thereby enhancing their long-term value and resilience (Rubio et al., 2018; Gao & Yu, 2020).

2.2 Revenue-to-Assets Ratio and Long-Term Investment Decisions

The Revenue-to-Assets ratio (RTA), a proxy for asset utilization measures how efficiently a firm employs its average total assets to generate revenue. A higher RTA indicates stronger conversion of assets into income and is often cited as a sign of operational excellence and strategic resource deployment (Patin, Rahman, & Mustafa, 2020).

Empirical evidence supports the notion that firms with high asset utilization are better positioned for long-term growth. Specifically, they tend to generate robust operational cash flows and maintain greater access to internally sourced investment capital (Rubio, Maroney, & Hassan, 2018). For firms in capital-intensive sectors such as banking, high RTA values may reduce reliance on external financing while strengthening the capability to invest in infrastructure upgrades, digital innovations, and regional expansion.

Lim and Mali (2018) further demonstrated that markets favor firms with superior efficiency metrics during periods of uncertainty. Investors interpret high RTA scores as indicators of prudent management, which could lead to sustained investment activity. However, Despite this indirect market valuation effect, very few studies have explicitly examined the direct relationship between RTA and actual realized CAPEX, particularly in emerging economies. For instance, Patin et al. (2020) explored asset utilization and corporate investment in financial services but focused primarily on asset turnover and general investment propensity rather than direct CAPEX outcomes. Similarly, Rubio et al. (2018) investigated efficiency of returns as a pricing factor, emphasizing market-based valuation rather than realized capital expenditure. Most related research, such as Lim and Mali (2018), centers on the signaling value of efficiency metrics for investor sentiment and market volatility, without empirically linking RTA to actual long-term investment spending. As a result, there remains a notable gap in the literature regarding the direct impact of asset utilization efficiency on realized capital expenditure, especially within the context of emerging market banking sectors.

2.3 Cost-to-Income Ratio and Long-Term Investment Decisions

The Cost-to-Income ratio (CIR) reflects a firm's operational efficiency by evaluating the proportion of income spent on operating expenses. A lower CIR implies greater efficiency, as fewer resources are used to generate each unit of revenue. This ratio is particularly salient in the banking sector, where operational efficiency directly impacts profitability, reserve ratios, and loan pricing (Lim & Mali, 2018; Cao, Nguyen, & Phan, 2022; Ahmed, Ayuba, & Garba, 2021).

Lim and Mali (2018) argue that in times of external volatility, inefficient firms may attract speculative investments due to their high-return potential, but efficient firms are favored for their long-term stability. Operational efficiency enables greater strategic foresight and disciplined cost management, which in turn supports long-term planning, such as infrastructure and technological investments (Cao et al., 2022).

Ding (2023) also emphasized the importance of using observable internal efficiency indicators like CIR to improve investment behavior analysis. Similarly, Ahmed et al. (2021) emphasized that firms in the maturity phase of their lifecycle typically display higher investment efficiency, largely due to refined cost management practices. Nevertheless, most of these studies rely on binary measures of investment outcomes (e.g., over- or under-investment) rather than continuous, realized investment indicators like CAPEX intensity.

Although prior research has recognized the importance of efficiency metrics in shaping firm valuation and investor sentiment (Lim & Mali, 2018; Gaio et al., 2023), very few empirical studies have directly tested the effect of internal operational efficiency via RTA and CIR on capital expenditure intensity, particularly in emerging banking contexts such as Nigeria. The predominant focus in literature remains on conceptual constructs (e.g., Q-theory, marginal returns) or predictive models, rather than observed, accounting-based metrics of realized investment (Gao & Yu, 2020).

Additionally, many existing studies explore the influence of external constraints like credit ratings (Xiao & Yu, 2023), financial constraints (Kim, Lee, & Paik, 2024), or market volatility but often overlook firm-internal behavioral metrics that may drive actual investment allocation decisions.

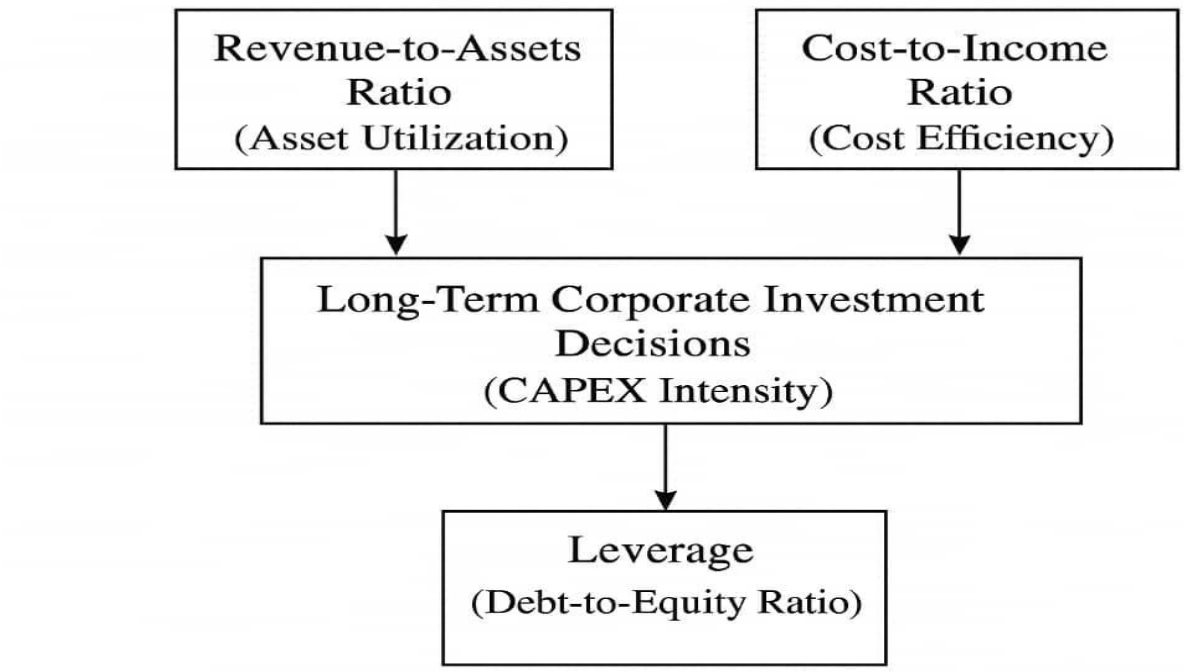
This study addresses this empirical void by focusing on efficiency ratios as operational tools for predicting real capital commitments, especially in regulation-intensive sectors like banking. Such an

approach contributes practical insights where traditional performance measures may obscure the nuances of long-term investment behavior, especially within developing economies.

2.4 Conceptual Framework

In this study, the conceptual framework is structured around three main variable categories. The independent variables are operational efficiency measures, specifically the Revenue-to-Assets Ratio (RTA), which captures asset utilization efficiency, and the Cost-to-Income Ratio (CIR), representing operational cost efficiency. These metrics reflect how effectively a bank generates revenue relative to its assets and controls its operating expenses, respectively. The dependent variable is Long-Term Corporate Investment Decisions, proxied by Capital Expenditure (CAPEX) Intensity, which measures the extent of a bank's commitment to long-term asset investment relative to its total assets. Additionally, Leverage, operationalized through the Debt-to-Equity Ratio, is included as a control variable to account for variations in capital structure, as it may influence or moderate the relationship between operational efficiency and long-term investment intensity.

Figure I: Relationships Between Efficiency Ratios and Long-Term Corporate Investment Decisions



Source: Authors' Design (2025).

The Revenue-to-Assets Ratio (RTA) is expected to have a positive effect on long-term investment (CAPEX Intensity). Higher asset efficiency contributes to greater internal funding capacity and confidence in future investment. The Cost-to-Income Ratio (CIR) is expected to have a negative effect on CAPEX Intensity. Higher CIR (i.e., more costs relative to income) signals inefficiency, thereby limiting reinvestment potential. Leverage acts as a control variable and may influence or moderate the strength of the relationship between operational efficiency and investment, though it's not the main focus.

2.5. Theoretical Underpinning

The theoretical foundation of this study is anchored in three interrelated frameworks: the Resource-Based View (RBV), Dynamic Capabilities Theory, and Signaling Theory. Each provides a distinct yet complementary perspective on how operational efficiency influences long-term corporate investment decisions, particularly within the context of Nigerian Deposit Money Banks.

The Resource-Based View, as articulated by Barney (1991), posits that firms achieve sustainable competitive advantage by acquiring, developing, and leveraging valuable, rare, inimitable, and non-substitutable (VRIN) internal resources. In this study, operational efficiency measured by the Revenue-to-Assets ratio (RTA) and the Cost-to-Income ratio (CIR) is conceptualized as a critical internal resource. Banks that efficiently utilize their assets, reflected in a higher RTA, and effectively control operational costs, indicated by a lower CIR, are able to generate surplus financial capacity. This surplus can then be strategically reinvested into long-term capital projects such as technological upgrades, asset acquisition, or branch expansion, all of which are essential for

sustained growth and competitiveness in the banking sector. The RBV thus directly supports the hypothesized positive relationship between RTA and CAPEX Intensity, as well as the negative relationship between CIR and CAPEX Intensity. Efficient banks, according to this view, are better positioned to commit resources to long-term investments, reinforcing the study's focus on internal efficiency as a driver of capital expenditure.

While the RBV emphasizes the possession of valuable resources, the Dynamic Capabilities framework, as developed by Teece, Pisano, and Shuen (1997), highlights a firm's ability to integrate, reconfigure, and renew these resources in response to rapidly changing environments. For Nigerian DMBs, dynamic capabilities are reflected in the ability to adapt operational processes, reallocate resources, and make agile investment decisions in the face of regulatory changes and technological disruption. High asset utilization (RTA) and effective cost management (CIR) are manifestations of these dynamic capabilities, enabling banks to sense and seize investment opportunities more rapidly than less efficient competitors. In this way, dynamic capabilities theory underpins the expectation that improvements in operational efficiency, as captured by higher RTA and lower CIR, will translate into greater CAPEX Intensity. Banks with dynamic capabilities are more likely to invest in long-term, value-creating projects, as they can flexibly and proactively respond to both internal and external changes.

From an external perspective, Signaling Theory, as proposed by Spence (1973), provides a behavioral and market-oriented rationale for the role of efficiency in shaping investment decisions. In this framework, efficiency ratios such as RTA and CIR serve as observable signals to external stakeholders including investors, regulators, and creditors about a bank's internal management quality and financial health. High RTA and low CIR signal disciplined management and robust operational performance, which can enhance a bank's reputation and lower its cost of external financing. This, in turn, can facilitate access to capital for long-term investments. Conversely, poor efficiency metrics may deter investment or increase financing costs. Lim and Mali (2018) further demonstrate that efficient firms are perceived as stable and attractive for long-term investment, reinforcing the study's premise that operational efficiency metrics are not only internal performance indicators but also external signals that influence actual investment behavior.

Collectively, these theories establish a robust conceptual foundation for the relationships examined in this study. The Resource-Based View and Dynamic Capabilities Theory both suggest that higher operational efficiency, as measured by RTA and CIR, enhances a bank's ability to allocate resources toward long-term investments, as reflected in CAPEX Intensity. Signaling Theory explains how these efficiency metrics influence external perceptions and access to capital, further supporting the link between internal efficiency and realized investment. The inclusion of financial leverage, proxied by the Debt-to-Equity ratio, as a control variable is also justified by these frameworks, as capital structure can moderate the extent to which internal efficiency translates into investment, especially in regulated environments such as banking.

2.7 Empirical Review

Empirical studies on the determinants of long-term corporate investment, particularly in the banking sector, have increasingly focused on the role of internal efficiency metrics and financial structure. In emerging markets, these relationships are often shaped by unique regulatory, economic, and institutional contexts.

A growing body of research has examined the impact of asset utilization on investment behavior. Patin et al. (2020) found that higher asset utilization, as measured by the Revenue-to-Assets ratio, is positively associated with increased internal capital investment in financial services firms. Their findings suggest that banks with more efficient asset management are better positioned to generate internal funds, which can be reinvested in long-term projects. Similarly, Rubio et al. (2018) demonstrated that efficiency of returns, proxied by asset-based ratios, can serve as a significant predictor of investment activity, especially in regulated industries. However, these studies often focus on general investment outcomes or market-based measures, rather than directly linking asset utilization to realized capital expenditure in the context of emerging market banks.

Recent studies have emphasized the importance of internal financial management and governance in shaping investment outcomes. For instance, Bamidele et al. (2025) demonstrated that effective working capital management enhances financial performance and supports long-term investment in Nigerian firms. Similarly, Olaoye and Bamidele (2023) found that robust audit committee structures improve financial reporting quality in Nigerian banks, thereby fostering an environment conducive to sound investment decisions. In the context of financial decision-making, Dauda and Bamidele (2026) provided empirical evidence linking prudent managerial choices to business growth among Nigerian SMEs, a relationship that may extend to larger financial institutions. Furthermore, Saif-Alyousfi (2025) highlighted that the effect of profitability on capital intensity is often moderated by the level of debt financing, suggesting that the interplay between leverage and investment is complex and context-dependent.

Cost efficiency has also been identified as a critical determinant of investment decisions. Cao et al. (2022) provided evidence from ASEAN countries

that banks with lower Cost-to-Income ratios are more likely to allocate resources to long-term investments, highlighting the importance of operational efficiency in supporting sustainable growth. Ahmed et al. (2021) further observed that firms in the maturity phase of their lifecycle, characterized by refined cost management practices, tend to exhibit higher investment efficiency. Ding (2023) reinforced this perspective by emphasizing the predictive value of internal efficiency indicators, such as the Cost-to-Income ratio, for real investment behavior. Despite these insights, much of the literature continues to rely on theoretical constructs or binary measures of investment efficiency, rather than continuous, accounting-based metrics like CAPEX Intensity.

The relationship between financial leverage and investment has produced mixed empirical results. Puspitasari and Muslim (2023) found that leverage can positively affect investment when firms operate under favorable credit conditions and stable macroeconomic environments. In contrast, Xiao and Yu (2023) argued that in highly regulated sectors such as banking, the marginal effect of leverage on investment is often diminished due to institutional buffers and strict capital requirements. This is particularly relevant in the Nigerian context, where regulatory oversight and macroeconomic volatility may limit the extent to which banks rely on debt financing for long-term investments. Bamidele et al. (2024) also examined the effect of financial leverage on firm performance in Nigeria, noting that sectoral differences and regulatory environments can moderate the leverage-investment relationship.

Beyond efficiency and leverage, other internal factors such as governance and internal controls have been shown to influence investment and performance outcomes in Nigerian banks. For example, Bamidele (2025) analyzed the effect of corporate governance on the financial performance of deposit money banks, finding that strong governance structures can enhance both efficiency and investment outcomes. Adeyiola et al. (2026) also highlighted the role of internal control systems in promoting ethical conduct and sound financial management, which indirectly supports long-term investment capacity.

2.8 Gap in Literature

Despite the growing body of research on corporate investment efficiency and the determinants of long-term investment in the banking sector, several important gaps remain, particularly in the context of emerging markets like Nigeria. Much of the existing literature has focused on developed economies or broader emerging market regions, often overlooking the unique regulatory, economic, and institutional dynamics that characterize the Nigerian banking environment (Gao & Yu, 2020; Gaio et al., 2023).

First, while studies such as Patin et al. (2020) and Rubio et al. (2018) have established the relevance of asset utilization and efficiency of returns for investment behavior, there is a paucity of empirical research directly linking specific efficiency ratios namely, the Revenue-to-Assets and Cost-to-Income ratios to realized long-term investment, as measured by CAPEX Intensity, in Nigerian Deposit Money Banks. Most prior research has relied on theoretical constructs or market-based proxies, rather than accounting-based measures that reflect actual capital expenditure decisions.

Second, the literature on cost efficiency and investment, as explored by Cao et al. (2022) and Ahmed et al. (2021), has largely centered on binary or categorical measures of investment efficiency, such as over- or under-investment, rather than continuous and observable indicators like CAPEX Intensity. This limits the practical applicability of findings for bank managers and policymakers seeking to understand the operational drivers of real investment outcomes.

Third, the role of financial leverage in shaping investment decisions remains ambiguous, with studies such as Puspitasari and Muslim (2023) and Xiao and Yu (2023) reporting mixed results depending on regulatory context and macroeconomic stability. However, there is limited evidence on how leverage interacts with internal efficiency metrics to influence long-term investment in the highly regulated Nigerian banking sector.

Finally, while governance and internal control systems have been shown to affect financial performance and ethical conduct in Nigerian banks (Bamidele, 2025; Adeyiola et al., 2026), their direct connection to efficiency-driven investment decisions has not been sufficiently explored. As a result, the empirical relationship between internal operational efficiency, financial leverage, and actual capital expenditure remains under-researched in the Nigerian context.

This study seeks to address these gaps by providing robust, context-specific evidence on how operational efficiency measured by Revenue-to-Assets and Cost-to-Income ratios and financial leverage jointly influence long-term investment decisions in Nigeria's listed Deposit Money Banks. By focusing on accounting-based measures of realized investment, the study aims to offer practical insights for both practitioners and regulators in the Nigerian banking industry.

3. Methodology

This study adopts an ex post facto research design, which is appropriate for analyzing historical data where the researcher does not manipulate independent variables, but rather observes existing conditions and retrospectively examines their effects on dependent variables. The ex post facto approach is justified in this context because the study seeks to investigate the influence of internal operational efficiency and financial leverage factors that naturally occur in organizational settings on long-term

corporate investment decisions as manifest in capital expenditures.

Moreover, this design provides the methodological basis for causal inference using panel regression techniques, enabling the identification of temporal and firm-specific variations in capital investment behavior over time. The research is also quantitative in nature, relying exclusively on numerical data extracted from publicly available financial statements of selected Nigerian Deposit Money Banks (DMBs).

As of 2024, there are thirteen (13) deposit money banks listed on the Nigerian Exchange (NGX). These include Access Holdings Plc (2021), Ecobank Transnational Incorporated (1985), FCMB Group Plc (2012), Fidelity Bank Plc (1987), FBN Holdings (2012), Guaranty Trust Holding Company Plc (2020), Jaiz Bank Plc (2003), Stanbic IBTC Holdings Plc (2012), Sterling Financial Holdings Company Plc (2021), United Bank for Africa Plc (1961), Unity Bank Plc (1987), Wema Bank Plc (1945), and Zenith Bank Plc (1990). Together, these banks represent the entire population of listed DMBs, a segment that holds significant weight in Nigeria's formal financial system due to their asset base, compliance obligations, and macroeconomic influence. These banks are subject to stringent regulatory reporting requirements by the Central Bank of Nigeria (CBN) and the Securities and Exchange Commission (SEC), making them ideal for data-driven research.

A census sampling technique was initially adopted to ensure comprehensive coverage of listed DMBs. However, two banks were excluded from the final sample due to data quality limitations and structural considerations:

- Jaiz Bank Plc was excluded due to its non-interest (Islamic) banking model, which significantly diverges from conventional commercial banking operations, particularly in capital structure and asset allocation practices.
- Unity Bank Plc was excluded due to consistent missing data and inconsistent financial disclosures over the study period.

The final sample therefore comprises 11 listed DMBs, observed across a span of 11 years (2014–2024), resulting in a balanced panel of 121 firm-year observations.

3.2 Data Sources

This study relies exclusively on secondary data obtained from several reputable sources. The primary data were extracted from the audited annual reports and financial statements of the selected Deposit Money Banks (DMBs), which were accessed directly from the official websites of the banks as well as the Nigerian Exchange Group (NGX) portal. Additional information was gathered from banking sector reports, prudential guidelines, and macroeconomic indicators published by the Central Bank of Nigeria (CBN). To ensure data accuracy and completeness, supplementary firm-specific data were verified using records from the Financial Reporting Council of Nigeria (FRC) and the Nigerian Deposit Insurance Corporation (NDIC) repositories. Data collection was carefully focused on obtaining consistent observations for the dependent, independent, and control variables across the entire study period from 2014 to 2024.

3.3 Measurement of Variables

All variables in this study are operationalized based on well-established financial ratios and consistent accounting definitions. A summary is provided in **Table 1** below.

Table 1: Variable Definition and Measurement

Variable	Proxy / Formula	Role	Expected Sign
CAPEX Intensity	CAPEX ÷ Average Total Assets	Dependent (DV)	
Revenue-to-Assets	(Net Interest Income + Non-Interest Income) ÷ Average Total Assets	Independent (IV1)	Positive (+)
Cost-to-Income	Operating Expenses ÷ Operating Income	Independent (IV2)	Negative (−)
Leverage (LEVR)	Total Liabilities ÷ Total Equity	Control Variable	Ambiguous (±)

3.5 Model Specification and Estimation Techniques

The empirical model for this study is adapted from the framework proposed by Al Ani and Chavali (2023), who examined the relationship between investment intensity and profitability measures from the perspective of foreign investors. In line with their approach, this study models capital expenditure intensity (CAPEX Intensity) as a function of key internal efficiency ratios and financial leverage.

The panel regression model is specified as follows:

$$CAPEX_{it} = \beta_0 + \beta_1 RTA_{it} + \beta_2 CIR_{it} + \beta_3 LEVR_{it} + \varepsilon_{it}$$

Where:

CAPEX = Capital Expenditure Intensity
RTA = Return to Assets Ratio
CIR = Cost to income ratio
LEVR = Leverage
ε_{it} = Idiosyncratic error term.
β_0 = Intercepts
β_1 - β_3 = Coefficients

3.6 Estimation Techniques

To choose the appropriateness of the panel model to use for the study, a Hausman specification test will be conducted against the Random Effects (RE) alternative. If the test results are significant, the FE model will be considered superior due to consistency.

Data Analysis and Results

This section presents the outcome of the empirical analyses conducted to evaluate the relationship between operational efficiency ratios and long-term corporate investment decisions among selected listed Deposit Money Banks (DMBs) in Nigeria from 2014 to 2024. The dependent variable; CAPEX Intensity serves as a direct proxy for long-term investment behavior, while the independent variables consist of Revenue-to-Assets ratio (RTA) and Cost-to-Income ratio (CIR). Leverage, proxied by the Debt-to-Equity ratio, is included as a control variable. Data were analyzed using descriptive statistics, correlation matrix, variance inflation factor analysis, and fixed effects (FE) panel regression, after model diagnostic tests confirmed its appropriateness. Interpretations of each stage of the analysis are provided immediately following results.

4.2 Descriptive Statistics

The summary statistics for all variables measured across 121 firm-year observations are presented in Table 4.1. These statistics include the mean, standard deviation, minimum and maximum values, skewness, kurtosis, Jarque-Bera test values, and their respective p-values.

Table 4.1: Descriptive Statistics of Variables

Statistic	CAPEX	RTA	CIR	LEV
Mean	0.0681	0.0975	0.6512	6.2745
Std. Deviation	0.0312	0.0221	0.1249	2.1432
Minimum	0.0112	0.0567	0.4013	2.3487
Maximum	0.1468	0.1452	0.8968	11.753
Skewness	0.72	0.53	-0.38	0.81
Kurtosis	3.41	2.87	2.54	2.96
Jarque-Bera (JB)	5.431	2.879	3.193	4.762
JB p-value	0.0660	0.2378	0.2028	0.0925
Observations (N)	121	121	121	121

Source: Authors' Computations (2026).

The average CAPEX Intensity (0.0681) suggests that, on average, the selected banks invest approximately 6.81% of their total assets in long-term capital projects annually. The minimum and maximum values (1.12% and 14.68%, respectively) indicate variability in investment patterns across banks and over time. The Revenue-to-Assets ratio has an average of 9.75%, highlighting generally moderate asset productivity among the banks, with some banks achieving over 14% asset efficiency. The Cost-to-Income ratio averages 65.12%, implying that, on average, Nigerian DMBs expend about 65% of their income on operational costs. A lower CIR would imply better cost efficiency.

In terms of distribution, skewness values show a moderate right skew for CAPEX, RTA, and Leverage, indicating that some banks have significantly higher values in these variables. The JB test p-values are all greater than 0.05, suggesting that the variables are approximately normally distributed, thereby meeting the assumptions for parametric statistical analysis.

4.3 Correlation Analysis

The Pearson correlation matrix was used to examine the bivariate relationships between dependent and independent variables and to assess any early signs of multicollinearity. The correlation results are presented in Table 4.2.

Table 4.2: Correlation Matrix

Variable	CAPEX	Revenue-to-Assets	Cost-to-Income	Leverage
CAPEX	1.000			
RTA	0.431	1.000		
CIR	-0.395	-0.521	1.000	
LEV	-0.128	0.115	-0.089	1.000

Source: Authors' Computations (2026).

The Revenue-to-Assets ratio has a statistically significant positive correlation (r = 0.431) with CAPEX Intensity, indicating that banks which better utilize their assets to generate revenue tend to invest more heavily in long-term capital projects. On the other hand, the Cost-to-Income ratio shows a significant negative correlation (r = -0.395) with CAPEX Intensity. This suggests that as banks become more cost-efficient (i.e., lower CIR), they are more likely to commit resources for long-term investments. The Leverage variable exhibits a weak and statistically insignificant correlation with CAPEX, implying a more complex or perhaps negligible direct relationship. Additionally, the correlation between the independent variables is below 0.7, indicating no immediate threat of multicollinearity.

4.4 Multicollinearity Diagnostics

Variance Inflation Factor (VIF) analysis was conducted to assess multicollinearity among explanatory variables.

Variable	VIF
RTA	1.36
CIR	1.41
LEVR	1.05
Mean VIF	**1.27**

Source: Authors' Computations (2026).

The VIF values are all below the critical threshold of 5, confirming the absence of multicollinearity in the independent variables. This allows for unbiased and stable estimation of regression coefficients in the subsequent panel data analysis.

4.5 Model Selection Tests

To determine the appropriate panel model for this study, preliminary model diagnostics were carried out:

Hausman Test for Model Selection:

Test Statistic	df	p-value
9.843	3	0.0201

Source: Authors' Computations (2026).

With a p-value of 0.0201, the Hausman test concludes that the Fixed Effects model is the preferred specification due to the consistency of estimators. Thus, the analysis proceeds with Fixed Effects regression to explore causal relationships.

4.6 Fixed Effects Regression Results

The results of the Fixed Effects regression analysis for the relationship between operational efficiency, leverage, and capital expenditure intensity (CAPEX Intensity) in listed Deposit Money Banks in Nigeria over the 2014–2024 period are presented in Table 4.3 below.

Table 4.3: Fixed Effects Regression Output

Variable	Coefficient	Std. Error	t-Statistic	p-value
RTA	0.3618	0.0973	3.72	0.0003
CIR	-0.2175	0.0841	-2.59	0.0111
LEVR	-0.0125	0.0086	-1.45	0.1489
C	0.0312	0.0124	2.52	0.0133

Model Summary:

Model Statistic	Value
R-squared	0.617
Adjusted R-squared	0.606
F-statistic	14.78
Prob (F-statistic)	0.0000
Durbin-Watson Statistic	1.97214

Source: Authors' Computations (2026).

The empirical results from the Fixed Effects model offer valuable insights into how internal indicators of efficiency and financial structure impact long-term investment behavior, measured as CAPEX Intensity, in Nigerian Deposit Money Banks.

The Revenue-to-Assets ratio, a proxy for asset utilization efficiency, shows a positive and highly significant impact on CAPEX Intensity, with a coefficient of 0.3618 and a p-value of 0.0003 (significant at the 1% level). This implies that,

holding other factors constant, a one-unit increase in RTA leads to a 36.18 percentage point increase in CAPEX Intensity. Although a one-unit increase is large and improbable in real terms, a more practical improvement such as increasing RTA by 0.05 (e.g., from 0.10 to 0.15) could result in a 1.81% increase in long-term investment activity. This finding reflects that Nigerian DMBs that more efficiently use their total assets to generate revenue are more likely to allocate greater resources to long-term investment projects such as digital infrastructure, cybersecurity, branch upgrades, and core banking software. The result aligns strongly with the Resource-Based View (RBV), which stresses the role of internally valuable and efficient resources in building sustainable competitive advantage. Efficient banks are better positioned financially to reinvest internally generated earnings into capital development, reducing their dependence on external financing.

The Cost-to-Income ratio, which captures cost efficiency, has a statistically significant negative relationship with CAPEX Intensity, with a coefficient of –0.2175 and a p-value of 0.0111 (significant at the 5% level). This indicates that a one-unit increase in CIR (which denotes worsening efficiency) would result in a 21.75 percentage point reduction in CAPEX Intensity. More realistically, a 0.10 increase in CIR (e.g., moving from 0.60 to 0.70) would lead to a 2.18% decrease in long-term investment allocation. This result reveals that banks with higher operating costs relative to income are less likely to commit to capital expenditures. Operational inefficiencies may erode the internal capital available for reinvestment, constrain reserve management, and force banks to prioritize short-term liquidity management over strategic, long-term spending. This outcome is consistent with Dynamic Capabilities Theory, which emphasizes the ability of efficient organizations to deploy resources flexibly and proactively in response to changing market and technological conditions. From a strategic perspective, a lower CIR reflects prudent operational discipline, making firms growth-oriented and investment-ready.

The Leverage ratio (Total Liabilities to Equity) bears a negative but statistically insignificant coefficient of –0.0125, with a p-value of 0.1489. This suggests that while increased leverage may weakly correlate with lower CAPEX Intensity, the effect is not strong enough to reach statistical significance at conventional levels. Therefore, no firm conclusions can be drawn about the influence of financial structure on long-term investment decisions in this specific context. One possible explanation is that highly leveraged banks in Nigeria face stricter regulatory constraints imposed by the Central Bank of Nigeria (CBN), including capital adequacy requirements, which may limit their ability to deploy further debt toward capital projects. Alternatively, banks may prefer to fund their CAPEX from internally generated earnings or retained profits rather than incurring additional debt, especially within an environment characterized by volatile interest rates and currency depreciation risks. Thus, leverage may play a more passive or context-contingent role in CAPEX decisions relative to efficiency metrics.

The model performs robustly, with an R-squared value of 0.617, indicating that 61.7% of the variance in CAPEX Intensity is explained by the combined effect of the Revenue-to-Assets ratio, Cost-to-Income ratio, and Leverage. The Adjusted R^2 of 0.606 further reinforces that the model holds explanatory value even after accounting for the number of predictors. The F-statistic of 14.78 and associated p-value (0.0000) confirm that the model is statistically significant overall. This means that the predictors, taken together, significantly influence long-term investment activity across the sampled banks.

Moreover, the Durbin-Watson statistic of 1.972 falls within the acceptable range (~2.0), indicating no significant autocorrelation in the residuals. This validates that the estimated relationships are reliable and not distorted by underlying statistical issues.

The regression analysis reveals that both dimensions of operational efficiency asset utilization (RTA) and cost management (CIR) are key internal drivers of long-term investment behavior among Nigerian deposit money banks. The findings emphasize that more efficient banks, those capable of generating higher revenue per unit asset and those that minimize operational costs relative to income, are more likely to allocate greater resources to capital expenditure.

On the other hand, leverage, while economically relevant in other sectors, shows no significant effect on CAPEX intensity in the context of Nigeria's regulated banking industry. This underlines the limited role debt financing plays in shaping long-term investment among highly regulated financial institutions.

The implications are particularly strategic: bank management should prioritize operational efficiency improvement as a means to unlock internal capacity for long-term investments, while regulators may consider efficiency metrics when designing supervisory tools that balance profitability with investment-driven growth.

These findings underscore the primacy of internal performance drivers rather than external financing structures in facilitating strategic investment among Nigerian banks.

4.7 Discussion of Findings

The findings of this study offer important insights into the role of internal operational efficiency and financial leverage in shaping long-term corporate investment decisions, as measured by capital expenditure intensity (CAPEX Intensity), among listed Deposit Money Banks (DMBs) in Nigeria. Drawing upon a decade-long panel dataset (2014–

2024), the results empirically validate key propositions from the Resource-Based View (RBV), Dynamic Capabilities Theory, and Signaling Theory, while also highlighting nuances specific to emerging financial systems.

The regression analysis revealed that the Revenue-to-Assets ratio has a positive and statistically significant effect on CAPEX Intensity ($\beta = 0.3618$, $p < 0.01$), indicating that banks with higher asset utilization efficiency those generating more revenue per unit of average total assets are more likely to increase their capital expenditures on long-term investment projects such as digital infrastructure, branch expansion, and technology upgrades. This finding is strongly aligned with previous research by Patin et al. (2020) and Rubio et al. (2018), who reported that efficient asset use is a predictor of investment propensity in firms operating under tight regulatory frameworks, with high internal efficiency leading to less reliance on external financing and more proactive capital budgeting. Theoretically, this result validates the RBV framework, which emphasizes that valuable, rare, and inimitable internal resources serve as the foundation for sustained investment and strategic decision-making (Barney, 1991). In the context of Nigerian banks, efficient asset utilization is a practical and strategic capability, enabling banks to reinvest operational surpluses into growth-enabling projects, especially when external credit constraints and regulatory restrictions are present. This finding also resonates with Signaling Theory, as articulated by Lim and Mali (2018), who argue that asset efficiency signals managerial competence and is positively interpreted by both internal governance structures and external stakeholders, thereby supporting long-term investment commitment.

The Cost-to-Income ratio was found to have a negative and statistically significant association with CAPEX Intensity ($\beta = -0.2175$, $p < 0.05$), implying that banks with higher cost inefficiencies those spending more relative to revenue are less inclined or able to channel resources into capital investment. This observation is supported by Ahmed et al. (2021) and Cao et al. (2022), who found that cost efficiency is an important predictor of investment strategy, particularly in capital-intensive, regulation-heavy sectors such as banking, with better cost discipline leading to greater reinvestment in technology and long-term productive assets. The negative relationship between CIR and CAPEX Intensity also ties into the implications of Dynamic Capabilities Theory (Teece et al., 1997), which highlights internal process efficiency as a critical enabler for resource adaptation and strategic flexibility. Efficient firms are better positioned to sense, seize, and transform toward long-term growth strategies, while inefficiency may breed a reactive, short-term focus that prioritizes liquidity preservation over strategic capitalization. This result is further consistent with policy-level observations by the Bank for International Settlements (BIS, 2020), which noted that in emerging markets, high operating costs are a major driver behind underinvestment in digital transformation within the banking sector.

The effect of leverage, proxied by the Debt-to-Equity ratio, on CAPEX Intensity was found to be negative but statistically insignificant ($\beta = -0.0125$, $p > 0.10$), indicating that the capital structure of the banks, at least in terms of their use of debt relative to equity, was not a significant determinant of long-term investment behavior in the sampled Nigerian DMBs. This finding deviates from some traditional capital structure theories, such as the Modigliani-Miller Framework under imperfect capital markets, and partially contradicts results from Puspitasari and Muslim (2023), who found that leverage positively affects investment when firms operate under favorable credit access conditions and stable macroeconomic environments. However, the insignificance of leverage aligns with recent work by Xiao and Yu (2023), which argued that in highly regulated sectors like banking, the marginal effect of leverage on investment decisions is weakened due to institutional buffers, internal capital requirements, and stricter risk-weighted asset management. In the Nigerian context, strict supervisory oversight by the Central Bank of Nigeria (CBN), including Basel III liquidity and solvency requirements, may discourage capital outlays financed via leverage. Practically, many Nigerian financial institutions exhibit a strong preference for internally funded growth due to volatile borrowing costs, unpredictable exchange rates, and perceived lender caution in volatile economic climates. Thus, the relatively muted influence of leverage in this study reflects a deeper reliance on internal performance revenue generation and cost control rather than external debt financing, further reinforcing the centrality of operational efficiency as a driver of long-term investment in the Nigerian banking sector.

5. Conclusion and Recommendations

This study examined the impact of operational efficiency and financial leverage on long-term corporate investment decisions among listed Deposit Money Banks (DMBs) in Nigeria. The findings reveal that internal efficiency metrics, specifically asset utilization and cost efficiency are statistically significant predictors of capital expenditure intensity, serving as key drivers of long-term investment. In contrast, leverage (debt-to-equity) showed no significant effect, suggesting that capital structure plays a limited and context-dependent role in the Nigerian banking sector. These results highlight the growing importance of internal performance benchmarks, especially in developing economies where regulatory constraints and macroeconomic volatility make reliance on external financing less viable. The study concludes that

operational efficiency is a more consistent and reliable determinant of long-term investment than leverage, reinforcing the need for banks to optimize internal processes as a foundation for sustainable growth.

Based on the findings of this study, which established that internal operational efficiency specifically asset utilization and cost efficiency plays a more significant role in influencing long-term corporate investment decisions than financial leverage, the following recommendation is offered:

Deposit Money Banks (DMBs) in Nigeria should prioritize improving operational efficiency as a strategic lever for enhancing long-term investment capacity. Efforts should focus on optimizing asset usage and reducing cost structures through digital transformation, process re-engineering, and effective resource management. These internal improvements will strengthen banks' ability to self-fund capital projects without excessive reliance on debt.

Furthermore, regulatory authorities like the Central Bank of Nigeria (CBN) are encouraged to promote efficiency-driven performance benchmarks and offer incentives to banks that demonstrate sustained improvements in asset productivity and cost management. This would not only support long-term investment but also enhance financial system stability.

Ultimately, aligning internal operational strategies with investment goals will better position Nigerian banks to navigate regulatory, economic, and competitive challenges while driving sustainable growth.

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