

Effect of Non-Current Assets on Shareholders' Value of Listed Oil and Gas Firms in Nigeria

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Abstract

This study examined the effect of non-current assets on the shareholders' value of listed oil and gas firms in Nigeria. Specifically, the study investigated the effect of land and building, plant and machinery, motor vehicle assets, and intangible assets on shareholders' value of listed oil and gas firms in Nigeria. The study adopted an ex post facto research design and utilized secondary data extracted from the audited annual reports of five listed oil and gas firms (Conoil Plc, Capital Oil and Gas Plc, TotalEnergies Marketing Nigeria Plc, MRS Oil Nigeria Plc, and Oando Plc) covering the period 2014–2023, yielding 50 firm-year observations. Shareholders' value was modelled as a function of the natural logarithms of land and building, plant and machinery, motor vehicle assets, and intangible assets. Descriptive statistics and panel-data diagnostic tests were conducted prior to estimation, while the Hausman specification test indicated that the fixed-effects model was the appropriate estimator ($\chi^2 = 14.34$, $p = 0.0063$). The findings revealed that land and building had a positive and highly significant effect on shareholders' value ($\beta = 51.91$, $p = 0.0012$), while plant and machinery ($\beta = -20.60$, $p = 0.0071$) and intangible assets ($\beta = -18.31$, $p = 0.0002$) exerted significant negative effects. Motor vehicle assets showed no statistically significant effect on shareholders' value ($\beta = -18.84$, $p = 0.1384$). A robustness check conducted by excluding Oando Plc showed that the positive effect of land and building remained stable, while the effects of plant and machinery and intangible assets became statistically insignificant, indicating sensitivity of these relationships to the inclusion of Oando Plc. The study concluded that investment in land and building enhances shareholders' value, while investments in plant and machinery and intangible assets require strategic evaluation and effective management to improve their contribution to shareholders' value. The study recommends that listed oil and gas firms prioritize strategic investments in land and building while ensuring that investments in plant and machinery and intangible assets are efficiently managed to generate sustainable economic benefits and maximize shareholders' value.

Keywords: Non-current assets; shareholders' value; land and building; intangible assets; fixed-effects model; oil and gas firms; Nigeria.

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Introduction

In modern corporate finance, the strategic allocation and management of non-current assets, particularly tangible assets such as land, buildings, and machinery, are central to the goal of maximising shareholder wealth. Within the Nigerian oil and gas sector, these assets form the operational backbone of firms and shape their long-term profitability because exploration, development, and production activities are highly capital-intensive (Aseinimieyeofori, 2022; Adika, 2015).

Non-current assets are defined as assets that provide economic benefits over more than one accounting period and are not held for resale in the ordinary course of business (Aggelopoulos et al., 2016). They include tangible items such as land, buildings, and plant and machinery, all of which are vital to the infrastructure and operations of oil and gas firms. Unlike current assets, non-current assets are relatively illiquid and require substantial capital outlay, which makes their efficient management important for safeguarding shareholders' equity.

In Nigeria, the oil and gas industry contributes significantly to national revenue and gross domestic product. Firms in the sector, however, operate under challenging regulatory and economic conditions that affect asset valuation, depreciation policy, and utilisation strategy. These conditions make it necessary to evaluate the extent to which non-current assets, particularly land and buildings, and plant and machinery, contribute to shareholders' value (Ezekwesili & Afodigbueokwu, 2021; Ullah & Ahmad, 2019).

Land and buildings are essential fixed assets in oil and gas operations. Land provides the spatial foundation for installations, pipelines, and refining units, while buildings offer structural support for housing equipment and personnel. As real property, these assets are expected to remain productive over extended periods and often serve as collateral or long-term investment markers on corporate balance sheets (Oluwatayo, Timothy & Ojo, 2019). Importantly, land is not depreciated because of its indefinite useful life. Buildings, on the other hand, depreciate over time, which affects their book value and their potential to enhance shareholder returns (Omole, 2009; Nickolas, 2022).

Plant and machinery are the dynamic operational tools required for processing, storage, and distribution in the industry. These capital-intensive assets generate revenue through the continuous processing of crude oil and gas. Their performance, maintenance, and replacement directly affect output levels and cost efficiency, with implications for profitability and, by extension, shareholders' equity (Ujam, Okolie & Sunday, 2023; Rao et al., 2003).

Despite their significance, the relationship between non-current assets and shareholders' fund has often been understated or inadequately documented in financial disclosures. This gap stems in part from the valuation options permitted under International Financial Reporting Standards (IFRS), particularly during first-time adoption (Adika, 2015). The choice between the cost model and the revaluation model creates disparities in asset reporting, which can influence investor perceptions and equity assessments. The long gestation period associated with returns on non-current asset investments also raises questions about their immediate impact on shareholder wealth. While large investments in land and machinery may signal growth prospects, they tie up capital and may reduce short-term liquidity (Andabai & Ogiriki, 2023). This trade-off requires a clear understanding of how such investments are reflected in shareholder value, particularly under Nigeria's volatile economic and regulatory conditions.

Statement of the Problem

For oil and gas firms in Nigeria to remain competitive and sustainable, investments in non-current assets such as land, buildings, and plant and machinery must be strategically managed and transparently reported. These assets form the foundation for operational efficiency, technological advancement, and capacity expansion. Firms must therefore adopt sound asset valuation methods, consistent depreciation policies, and robust disclosure practices that reflect the true economic value of these resources. Clear and reliable reporting enhances shareholder confidence, supports efficient capital allocation, and ensures alignment with global financial reporting standards.

Despite their importance, the valuation and reporting of non-current assets remain inconsistent among listed oil and gas firms in Nigeria. Discretion in accounting treatment under IFRS permits varied measurement approaches that often obscure the real impact of these assets on shareholders' fund. Land and buildings, while critical, may be under-reported or aggregated with other asset classes, reducing their visibility in financial analysis. Plant and machinery are susceptible to wear, obsolescence, and maintenance challenges, yet their contribution to shareholder value is not always clearly reflected. This lack of clarity weakens investors' ability to assess a firm's true financial health and long-term viability. It is therefore essential to empirically investigate the specific effects of land and buildings, and plant and machinery on shareholders' fund within Nigeria's oil and gas sector.

Objectives of the Study

The main objective of the study is to examine the effect of non-current assets on shareholders' value of listed oil and gas firms in Nigeria. The specific objectives are to:

- i. Determine the effect of land and building on shareholders' value of listed oil and gas firms in Nigeria.
- ii. Examine the effect of plant and machinery on shareholders' value of listed oil and gas firms in Nigeria.
- iii. Assess the effect of motor vehicle assets on shareholders' value of listed oil and gas firms in Nigeria.
- iv. Evaluate the effect of intangible assets on shareholders' value of listed oil and gas firms in Nigeria.

Research Questions

The following research questions were formulated to guide the investigation:

- i. To what extent does land and building affect shareholders' value of listed oil and gas firms in Nigeria?
- ii. To what extent does plant and machinery affect shareholders' value of listed oil and gas firms in Nigeria?
- iii. To what extent do motor vehicle assets affect shareholders' value of listed oil and gas firms in Nigeria?
- iv. To what extent do intangible assets affect shareholders' value of listed oil and gas firms in Nigeria?

Statement of the Hypotheses

The following hypotheses, stated in the null form, guided the study:

- H0₁: Land and building has no significant effect on shareholders' value of listed oil and gas firms in Nigeria.
- H0₂: Plant and machinery has no significant effect on shareholders' value of listed oil and gas firms in Nigeria.
- H0₃: Motor vehicle assets have no significant effect on shareholders' value of listed oil and gas firms in Nigeria.
- H0₄: Intangible assets have no significant effect on shareholders' value of listed oil and gas firms in Nigeria.

Review of Related Literature

Conceptual Review

Non-current assets

Non-current assets are resources that provide economic benefits over a period exceeding one year and are not held for resale (Ezeana & Ezeagba, 2024). They include tangible items such as land, buildings, plant, and machinery, as well as intangible items such as patents and goodwill. Their primary role is to support production and service delivery, contributing directly or indirectly to revenue generation over time (Aggelopoulos et al., 2016).

Adika (2015) describes non-current assets as long-term investments recorded on the statement of financial position at historical cost, adjusted for depreciation and impairment. In the oil and gas sector, these assets are vital because exploration, drilling, refining, and distribution are capital-intensive. Ashmarina and Zotova (2015) note that the permanence of non-current assets gives them strategic importance for the sustainability and competitive advantage of firms.

A defining feature of non-current assets is their illiquidity: they cannot readily be converted to cash without significant time loss or value loss (Aleksandra, 2021). This characteristic requires careful investment decisions and proper accounting treatment. Under IFRS, firms may adopt either the cost model or the revaluation model for measuring property, plant, and equipment after initial recognition (IAS 16). The choice of model affects how asset values are reported and perceived by stakeholders.

Nangih and Onuora (2020) note that non-current assets are used for value creation through consistent operational use rather than for resale. Their composition and utilisation reveal a firm's strategic orientation toward growth and asset optimisation. Efficient management and disclosure of non-current assets are therefore central to investor confidence and to the accurate reflection of a company's financial health (Aseinimieyeofori, 2022).

Tangible Non-Current Assets

Tangible non-current assets are physical assets such as real estate and equipment used to produce goods and services. Onuigbo and Okafor (2024) describe them as property, plant, and equipment. Udeh (2017) notes that they form a major component of the financial statements of many industries. Okobo, Ugwoke, and Akpan (2022) observe that they are capital-intensive and expected to last for more than one accounting year. Nangih and Emeka-Nwokeji (2021) likewise identify them with property, plant, and equipment. Lyandres and Palazzo (2016) report that tangible non-current assets often account for more than 80% of the total assets of a manufacturing firm.

The interest of scholars and practitioners in tangible non-current assets has grown because of their role in business operations (Zhang, 2017; Chukwu et al., 2017; Nangih, Turakpe & Davies, 2020). Offor and Farajimakim (2020) argue that the quality of tangible non-current assets can determine product quality and the long-term survival of the firm. Egwu, Ohachosim, and Itah (2023) conclude that an increase in investment in tangible non-current assets leads to improved performance of manufacturing firms. Ibam (2008) notes that a firm's investment in tangible non-current assets depends on its line of business, an observation that holds particularly for capital-intensive industries such as oil and gas.

When recording the value of tangible non-current assets, businesses document the original cost less accumulated depreciation. Many assets depreciate over time, but some, such as land, often appreciate, while machinery depreciates with use. The efficiency of tangible non-current assets can be judged in relation to the revenue they generate.

Land and building

Land and building are fundamental components of tangible non-current assets, particularly in capital-intensive industries such as oil and gas. They provide the physical infrastructure on which industrial operations depend: land serves as the base for drilling, storage, refining, and administrative installations, while buildings shelter machinery, staff, and operational processes (Aseinimieyefori, 2022). In accounting terms, both are classified as long-term assets because they are used over extended periods and are not held for resale (Omole, 2009).

A distinguishing feature of land is its indefinite useful life: it does not depreciate. Buildings, however, depreciate and must be periodically evaluated to reflect wear and tear, obsolescence, or changes in market value (Oluwatayo, Timothy & Ojo, 2019). Under IAS 16, land and buildings are recorded at historical cost; buildings are depreciated, while land retains its book value unless impaired (Adika, 2015).

From a strategic perspective, land and buildings are capital-intensive investments that signal a firm's long-term commitment to growth and operational stability. Onuigbo and Okafor (2024) argue that these assets represent the tangible backbone of asset portfolios in oil and gas firms. Land can appreciate over time, contributing indirectly to firm valuation and shareholders' equity. Because of liquidity constraints and valuation complexity in volatile markets, however, the actual impact of land and building on shareholders' fund is often obscured (Nickolas, 2022). Inadequate disclosures or aggregation with other asset categories may further limit investor insight into their contribution to corporate value. Nangih and Onuora (2020) emphasise that these assets are not passive holdings but active generators of long-term economic returns.

Plant and Machinery

Plant and machinery are central to the operational capacity of oil and gas firms. They include equipment, industrial tools, and processing units used in drilling, refining, transportation, and storage. Their importance lies in their direct involvement in revenue-generating activities and their contribution to asset capitalisation and productivity (Ujam, Okolie & Sunday, 2023). In financial accounting, they are recorded at historical cost and depreciated over their useful lives, reflecting the consumption of economic benefits over time (Adika, 2015). Unlike land, these assets are subject to wear, obsolescence, and periodic replacement. Rao et al. (2003) note that investment in machinery enhances worker productivity and operational efficiency, making it a key factor in cost control and profitability.

The oil and gas sector demands substantial investment in technologically advanced machinery and equipment. The size and quality of a firm's plant and machinery indicate its capacity for large-scale operations and its resilience in a competitive market (Stergois & Prodogans, 2014). These assets also enable firms to meet production targets and comply with regulatory standards, supporting sustained revenue streams and shareholder returns.

Managing plant and machinery effectively, however, involves challenges: high maintenance costs, technological obsolescence, and the need for periodic capital expenditure. If assets are not upgraded or maintained properly, they may become liabilities, draining resources and reducing firm value (Okobo, Ugwoke & Akpan, 2022). Outdated machinery can lead to operational inefficiencies, increased downtime, and excessive repair costs, all of which negatively impact profitability and shareholder value (Abdi, 2008). From a shareholder's perspective, plant and machinery are strategic investments that, when optimally deployed, can boost firm value, improve investor confidence, and contribute to the overall financial health of the firm (Egwakhe, Momah & Akande, 2023).

Shareholders' Value

Shareholders' value refers to the economic wealth created for the owners of a company through effective management of its resources and strategic investment decisions. It represents the value attributable to shareholders after all obligations have been met and reflects the extent to which a firm's activities enhance owners' wealth over time. Shareholders' value is commonly associated with improvements in profitability, growth in equity, appreciation in firm value, and the ability to generate sustainable returns for investors (Hassan et al., 2014). In this study, shareholders' value is operationalised using shareholders' fund (book value of equity), which represents the residual interest in the assets of the firm after deducting all liabilities.

The concept of shareholders' value is founded on the principle that management should make decisions that maximise the wealth of shareholders through efficient resource allocation, profitable operations, and sustainable growth. Egwakhe, Momah, and Akande (2023) argue that shareholders' value is created through the strategic utilisation of organisational resources to improve profitability, strengthen the firm's financial position, increase investors' confidence, and enhance long-term returns. Investments in non-current assets that improve operational efficiency and generate future economic benefits contribute to the growth of shareholders' value by increasing retained earnings and strengthening the firm's equity base.

In asset-intensive industries such as the oil and gas sector, shareholders' value is closely linked to the acquisition, utilisation, and management of non-current assets. These firms commit substantial financial resources to land and buildings, plant and machinery, motor vehicles, and intangible assets, expecting such investments to generate future cash flows and improve organisational performance. However, because these assets often require considerable capital outlay and have long economic lives, their contribution to shareholders' value may only become evident over time (Onuigbo & Okafor, 2024). Consequently, the efficiency with which these assets are acquired, utilised, maintained, and managed plays a significant role in determining the value ultimately created for shareholders.

Shareholders' value also serves as an important indicator of managerial effectiveness in allocating corporate resources. Investors and other stakeholders often evaluate management's performance based on its ability to convert long-term investments into sustainable financial returns and wealth creation. Ezekwesili and Afodigbueokwu (2021) contend that capital allocation decisions, particularly those relating to long-term assets and infrastructure, should be guided by the objective of maximising shareholders' wealth. Accordingly, firms that efficiently manage their non-current assets are more likely to enhance shareholders' value through improved financial performance, stronger equity positions, and sustained long-term growth.

Asset valuation and depreciation under IFRS

Under IFRS, the valuation and depreciation of non-current assets are governed by principles aimed at ensuring transparency, consistency, and comparability in financial reporting. These standards are particularly important in asset-intensive industries such as oil and gas. IAS 16 allows companies to adopt either the cost model or the revaluation model for measuring property, plant, and equipment after initial recognition. The cost model records the asset at historical acquisition cost less accumulated depreciation and impairment losses. The revaluation model permits periodic remeasurement at fair value, provided that fair value can be measured reliably (Adika, 2015). This flexibility, while useful, introduces discretion into financial reporting, which may lead to inconsistencies across firms and time periods.

Land typically has an indefinite useful life and is not depreciated, although it may be impaired if its value falls below carrying cost. Buildings have a defined useful life and are depreciated using methods such as the straight-line method or the reducing-balance method (Nickolas, 2022). Plant and machinery also depreciate and may require revaluation or impairment testing depending on usage, wear, or market developments (Aggelopoulos et al., 2016).

The accounting treatment chosen affects the firm's reported asset base, depreciation expense, and ultimately net income and shareholders' equity. In capital-intensive sectors such as oil and gas, where plant, building, and machinery assets dominate, depreciation policies can significantly influence reported profitability and equity levels (Stergois & Prodogans, 2014). Overstated depreciation may understate profits and retained earnings, while understated depreciation may overstate them. The proper application of these standards is therefore essential for aligning asset management with shareholder expectations in Nigeria's oil and gas industry.

Capital intensity in the oil and gas sector

The oil and gas sector is inherently capital-intensive, with substantial investments in non-current assets such as land, buildings, drilling rigs, pipelines, refineries, and heavy machinery. These assets are essential to exploration, extraction, transportation, and refining, and they form the operational backbone of firms in the industry (Stergois & Prodogans, 2014; Aseinimieyefori, 2022).

Capital intensity refers to the extent to which a firm relies on fixed, long-term assets relative to labour or variable inputs. Oil and gas operations require large-scale infrastructure, often involving high upfront costs, long gestation periods, and relatively slow asset turnover. Ujam, Okolie, and Sunday (2023) observe that these fixed investments are crucial for building production capacity, enhancing efficiency, and achieving economies of scale, all of which can improve profitability and shareholder returns over time.

The high capital requirements also pose risks. Heavy investment in land, buildings, or plant and machinery ties up significant financial resources that could otherwise be allocated to flexible or liquid investments. If such capital expenditure does not yield proportional increases in revenue or operational efficiency, the firm may face liquidity constraints, increased debt, or diminished returns on equity (Onuigbo & Okafor, 2024). The long-term nature of these assets also exposes firms to risks from depreciation, technological obsolescence, regulatory changes, and commodity price volatility. In Nigeria, oil price volatility and frequent shifts in regulatory frameworks, including the Petroleum Industry Act of 2021, add layers of uncertainty to capital investments. These externalities can erode asset values and undermine their contribution to shareholders' fund, particularly when depreciation or impairment losses are not adequately accounted for (Adika, 2015; Egwakhe, Momah & Akande, 2023).

Theoretical Framework

The study draws on two complementary theories: Agency Theory and the Resource-Based View.

Agency Theory

Agency Theory addresses the relationship between principals (shareholders) and agents (managers) of a firm. Berle and Means (1932) first drew attention to the separation of ownership and control in modern corporations, while Jensen and Meckling (1976) formalised the agency-cost framework. The theory argues that conflicts of interest arise when managers pursue objectives that diverge from those of shareholders, leading to agency costs in the form of monitoring, bonding, and residual losses.

Ross (1973) observed that firm growth often benefits managers more than shareholders. Adam Smith (1776) similarly noted that hired managers seldom take as much care of a firm's resources as owners do. Fama and Jensen (1983) argued that agency problems intensify when managers do not hold a significant equity stake in the firm, and that these problems can be mitigated by separating decision initiation and implementation from decision ratification and monitoring. For oil and gas firms in Nigeria, where capital allocation decisions involve large, long-term non-current asset investments, agency problems may manifest as over-investment in physical assets (empire-building) or under-investment in maintenance and modernisation. Such behaviour can erode shareholders' fund.

Resource-Based View

The Resource-Based View (RBV), developed by Barney (1991), holds that firms achieve sustained competitive advantage when they possess resources that are valuable, rare, inimitable, and non-substitutable. Tangible non-current assets such as land, buildings, and specialised plant and machinery can satisfy these conditions in capital-intensive industries, because they are difficult for rivals to acquire quickly and they support firm-specific operational capabilities. Within the RBV, the strategic deployment of these resources should translate into superior financial performance and shareholder wealth.

The RBV therefore predicts that, *ceteris paribus*, investments in land, building, and plant and machinery should have a positive effect on shareholders' fund in oil and gas firms.

Empirical Review

Onuigbo and Okafor (2024) examined the effect of assets composition on the financial performance of listed industrial goods firms in Nigeria using data for 2013–2022 analysed with descriptive statistics, Pearson correlation, and multiple regression, and found that non-current assets significantly affected financial performance.

Emengini, Anisiuba, and Chukwuemeka (2023) examined asset structure and corporate performance of levered firms listed on the Nigerian Exchange Group (NGX) from 2011–2020 using pooled OLS regression, finding that non-current and intangible asset ratios had a passive influence on both internal and external performance across high- and low-levered firms.

Madukwe, Nwoha, and Nwabuisi (2022) examined the effect of corporate assets on the market value (share price) of Nigerian oil and gas firms using multiple regression and found that current assets, non-current assets, and intangible assets each had a positive and significant effect on share price.

Kornom-Gbaraba, Olatunde, and Olalere (2024) investigated financial and current asset structure and corporate performance of listed Nigerian manufacturing firms (2018–2022) and found no statistically significant effect at the 5 percent level using ordinary least squares. Enekwe, Ayogu, and Bolaji (2023) examined non-current assets and financial performance of four listed consumer goods firms (2010–2019) using panel OLS in E-Views and reported a positive but statistically insignificant effect of non-current assets on return on assets.

Inyiama, Ugbor, and Chukwuani (2017) evaluated asset growth rate and financial performance for six manufacturing firms (2006–2015) using Pearson correlation and multiple regression and found non-current asset growth positively and strongly related to net asset growth.

Taken together, these studies establish mixed evidence on the asset–value relationship, ranging from significant positive effects (Onuigbo & Okafor, 2024; Madukwe et al., 2022) to insignificant effects (Kornom-Gbaraba et al., 2024; Enekwe et al., 2023) and passive or negative influence in some specifications (Emengini et al., 2023). Notably, none of these studies decomposed non-current assets into land and building, plant and machinery, motor vehicle, and intangible assets simultaneously within a single multiple-regression model estimated on a properly specified panel, the gap this revised study addresses directly.

Methodology

Research Design

The study adopts an *ex post facto* research design because it relies on historical data obtained from audited annual reports of listed firms without any manipulation of the study variables. The design is appropriate for examining cause-and-effect relationships using existing financial information.

Area of Study

The study is conducted in Nigeria and focuses on oil and gas firms listed on the Nigerian Exchange Group (NGX). The study covers the ten-year period from 2014 to 2023.

Sources of Data

Data for this study were obtained entirely from secondary sources, specifically the audited annual reports and accounts of the sampled oil and gas firms covering the period 2014–2023. The reports were sourced from the firms' official websites and the Nigerian Exchange Group.

Population of the Study

The population comprises all oil and gas firms listed on the Nigerian Exchange Group (NGX) as at 31 December 2023.

Sample Size and Sampling Technique

A purposive sample of five firms was drawn from the population: Conoil Plc, Capital Oil and Gas Plc, TotalEnergies Marketing Nigeria Plc, MRS Oil Nigeria Plc, and Oando Plc. The selection criterion was the availability of complete, audited annual report data for all ten years of the study window (2014–2023) at the point of data extraction, yielding a fully balanced panel of 50 firm-year observations (5 firms × 10 years, with no missing firm-years).

Measurement of Variables

The study comprises one dependent variable and four independent variables. The dependent variable is shareholders' value (SHV), while the independent variables are land and building (LB), plant and machinery (PM), motor vehicle (MV), and intangible assets (IA). The variables are measured using values extracted from the audited annual reports and accounts of the sampled firms.

Table 3.1: Operational Measurement of Variables

Variable	Type	Measurement	Source
Shareholders' Value (SHV)	Dependent	Total shareholders' equity (shareholders' fund) as reported in the statement of financial position.	Audited Annual Reports
Land and Building (LB)	Independent	Book value of land and buildings reported under property, plant and equipment.	Audited Annual Reports
Plant and Machinery (PM)	Independent	Book value of plant and machinery reported under property, plant and equipment.	Audited Annual Reports
Motor Vehicle (MV)	Independent	Book value of motor vehicles reported under property, plant and equipment.	Audited Annual Reports
Intangible Assets (IA)	Independent	Book value of identifiable intangible assets reported in the statement of financial position.	Audited Annual Reports

To improve comparability across firms and minimise the influence of scale differences and skewness commonly associated with financial statement data, the explanatory variables (Land and Building, Plant and Machinery, Motor Vehicle, and Intangible Assets) are transformed into their natural logarithms prior to regression estimation. However, Shareholders' Value (SHV) is retained in its original form because it represents the outcome variable of interest and its interpretation in monetary terms is considered more meaningful for policy and managerial implications.

Method of Data Analysis

The study employed panel data regression analysis to examine the effect of non-current assets on shareholders' value of listed oil and gas firms in Nigeria. A multiple regression model was estimated, incorporating land and building, plant and machinery, motor vehicle assets, and intangible assets as explanatory variables. Three estimation techniques were considered: Pooled Ordinary Least Squares (OLS), Fixed Effects, and Random Effects models. The appropriate model for interpretation was selected based on formal specification tests, including the redundant fixed-effects F-test and the Hausman specification test.

Prior to regression estimation, descriptive statistics were conducted to examine the characteristics of the variables, followed by Pearson correlation analysis and variance inflation factor (VIF) tests to assess the presence of multicollinearity among the explanatory variables. A Levin, Lin and Chu (LLC) panel unit root test was also performed to determine the stationarity properties of the variables. After selecting the appropriate regression model, post-estimation diagnostic tests were conducted, including the Modified Wald test for groupwise heteroskedasticity, the Wooldridge test for serial correlation, and the Pesaran cross-sectional dependence test. Where the diagnostic tests indicated the presence of heteroskedasticity and/or serial correlation, robust standard errors were employed to obtain consistent and reliable parameter estimates. This robustness procedure enhances the validity of the estimated coefficients and their associated test statistics without altering the underlying model specification.

Model Specification

The panel regression model is specified as:

$$SHV_{it} = \beta_0 + \beta_1 \ln(LB_{it}) + \beta_2 \ln(PM_{it}) + \beta_3 \ln(MV_{it}) + \beta_4 \ln(IA_{it}) + u_i + \epsilon_{it} \dots \dots \dots (i)$$

Where, SHV_{it} is shareholders' value (₦'billion) of firm i in year t ; LB_{it} , PM_{it} , MV_{it} , and IA_{it} are the naira book values of land and building, plant and machinery, motor vehicle, and intangible assets respectively; β_0 is the constant; β_1 to β_4 are the coefficients to be estimated; u_i is the firm-specific (fixed or random) effect; and ϵ_{it} is the idiosyncratic error term.

Data Presentation and Analysis

Descriptive Statistics

Table 4.0: Summary Statistics

Variable	Mean	Median	Max	Min	Std.Dev	Skewness	Kurtosis	Jarque-Bera	Prob.
SHV (₦'bn)	-5.6336	18.0970	56.0777	-460.0733	82.6353	-4.0273	20.7272	789.8545	0.0000
LNLB	22.0604	22.6758	24.4875	19.5602	1.7979	-0.2908	1.4887	5.4629	0.0651
LNPM	21.9002	23.1141	24.4875	16.3570	2.5119	-1.0691	2.6459	9.7864	0.0075
LNMV	19.8044	21.0294	22.8262	13.4741	3.0070	-1.2423	3.0972	12.8812	0.0016
LNIA	17.6829	17.7630	27.1569	12.8959	3.5591	0.8645	4.0275	8.4272	0.0148

The mean shareholders' value (SHV) of ₦-5.63 billion, compared with a positive median value of ₦18.10 billion, indicates the presence of extreme negative observations among the sampled firms, particularly in some firm-years associated with Oando Plc during the later years of the study period. The large standard deviation (₦82.64 billion), high kurtosis value (20.73), and significant Jarque-Bera statistic (789.85, $p = 0.0000$) confirm substantial deviation from normality, reflecting the influence of extreme values within the dataset. This characteristic is further examined through the robustness analysis.

The logarithmically transformed non-current asset variables (LNLB, LNPM, LNMV, and LNIA) exhibit relatively improved distributional properties compared with SHV. Land and building (LNLB) demonstrates near-normal distribution, as indicated by its skewness (-0.2908), kurtosis (1.4887), and insignificant Jarque-Bera probability value ($p = 0.0651$). However, plant and machinery (LNPM), motor vehicle assets (LNMV), and intangible assets (LNIA) record significant Jarque-Bera statistics, suggesting the presence of some firm-specific variations and extreme observations within these variables. These variations may reflect differences in asset composition, investment patterns, and financial characteristics among the sampled oil and gas firms.

Correlation Matrix and Multicollinearity Diagnostics

Table 4.1: Pearson Correlation Matrix

	SHV	LNLB	LNPM	LNMV	LNIA
SHV	1.0000				
LNLB	0.4638	1.0000			
LNPM	0.0340	0.7388	1.0000		
LNMV	-0.0456	0.7182	0.9044	1.0000	
LNIA	-0.5977	0.0886	0.4476	0.6434	1.0000

Table 4.2: Variance Inflation Factor (VIF)

Variable	VIF	Tolerance (1/VIF)	Assessment
LNLB	4.065	0.246	Acceptable
LNPM	6.616	0.151	Acceptable
LNMV	13.975	0.072	Elevated — caution
LNIA	3.678	0.272	Acceptable

The Pearson correlation matrix in Table 4.1 indicates that shareholders' value (SHV) is positively associated with land and building (LNLB) ($r = 0.4638$), weakly associated with plant and machinery (LNPM) ($r = 0.0340$), negatively associated with motor vehicle assets (LNMV) ($r = -0.0456$), and moderately negatively associated with intangible assets (LNIA) ($r = -0.5977$). Among the explanatory variables, plant and machinery and motor vehicle assets exhibit a strong positive correlation ($r = 0.9044$), suggesting the possibility of multicollinearity.

The variance inflation factor (VIF) results presented in Table 4.2 show that land and building (VIF = 4.065), plant and machinery (VIF = 6.616), and intangible assets (VIF = 3.678) are within the generally acceptable threshold of 10 (Hair et al., 2019). However, motor vehicle assets recorded a VIF of 13.975, indicating a relatively high degree of multicollinearity, largely attributable to its strong correlation with plant and machinery. Although this level of multicollinearity may reduce the precision of the estimated coefficients for these variables, motor vehicle assets were retained in the model because they constitute one of the core explanatory variables of the study. Consequently, the estimated effect of motor vehicle assets should be interpreted with caution, as the observed statistical insignificance may partly reflect multicollinearity rather than the complete absence of an underlying relationship with shareholders' value.

Panel Unit Root Test

Table 4.3: Levin-Lin-Chu-Style Panel Unit Root Test (level, with firm effects)

Variable	ρ coefficient	t-statistic	Prob.	Decision at level
SHV	0.5215	4.9280	0.0000	Unit root present (non-stationary)
LNLB	-0.7800	-17.3052	0.0000	Stationary
LNPM	-0.9102	-5.9029	0.0000	Stationary
LNMV	-0.3215	-3.2218	0.0026	Stationary
LNIA	-0.3365	-2.5661	0.0142	Stationary

Table 4.3 presents the Levin–Lin–Chu-style panel unit root test results for the study variables. The results indicate that the explanatory variables—land and building (LNLB), plant and machinery (LNPM), motor vehicle assets (LNMV), and intangible assets (LNIA)—are stationary at level, as their probability values are statistically significant at the 5% level. However, shareholders' value (SHV) is found to be non-stationary at level, suggesting the presence of a unit root.

The stationarity of the explanatory variables indicates that the asset-related variables do not exhibit persistent stochastic trends over the study period, thereby supporting their suitability for panel regression analysis. Although shareholders' value is non-stationary at level, the use of the fixed-effects estimator helps to control for unobserved firm-specific characteristics that may influence the dependent variable. The subsequent regression analysis therefore proceeds with the fixed-effects model selected through the Hausman specification test, with the results interpreted within the context of the sampled firms and study period.

Model Selection: Redundant Fixed Effects and Hausman Tests

Table 4.4: Redundant Fixed Effects Test (Pooled OLS vs Fixed Effects)

Effects Test	Statistic	d.f.	Prob.
Cross-section F	3.3003	(4, 41)	0.0196

The redundant fixed-effects F-test rejects the null that firm effects are jointly zero ($F = 3.30$, $p = 0.0196$), indicating the Fixed Effects model is preferred to Pooled OLS.

Table 4.5: Hausman Test (Fixed Effects vs Random Effects)

Variable	Fixed (β)	Random (β)	Var(Diff.)
LNLB	51.9141	25.3420	26.5722
LNPM	-20.5983	-12.4064	-8.1919
LNMV	-18.8430	9.6998	-28.5428
LNIA	-18.3091	-16.3657	-1.9434
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	14.3345	4	0.0063

The Hausman test produced a Chi-square statistic of 14.3345 with a probability value of 0.0063, which is statistically significant at the 5 percent level. Consequently, the null hypothesis that the Random Effects model is appropriate is rejected in favour of the Fixed Effects model. This indicates that the unobserved firm-specific effects are correlated with the explanatory variables, making the Fixed Effects estimator the more appropriate model for analysing the effect of non-current assets on shareholders' value of listed oil and gas firms in Nigeria. Accordingly, the Fixed Effects regression results are adopted for interpretation and hypothesis testing.

Panel Regression Results

Table 4.6 reports all three estimators side by side for transparency and comparability. Only the Fixed Effects column is interpreted as the study's substantive finding.

Table 4.6: Panel Regression Results — Pooled OLS, Fixed Effects, and Random Effects

Variable	Pooled OLS	Fixed Effects (selected)	Random Effects
C	-195.6891 (0.1639)	— (entity-specific)	-195.6891 (0.1639)
LNLB	25.3420 (0.0034)	51.9141 (0.0012)	25.3420 (0.0034)
LNPM	-12.4064 (0.1043)	-20.5983 (0.0071)	-12.4064 (0.1043)
LNMV	9.6998 (0.2913)	-18.8430 (0.1384)	9.6998 (0.2913)
LNIA	-16.3657 (0.0001)	-18.3091 (0.0002)	-16.3657 (0.0001)
R-squared	0.6481	0.7338 (overall) / 0.5858 (within)	0.6481
Adj. R-squared	0.6168	—	0.6168
F-statistic	20.7210	—	20.7210
Prob(F-stat)	0.0000	—	0.0000
Akaike info criterion	10.8021	10.6830	—
Schwarz criterion	10.9933	11.0271	—
Hannan-Quinn criterion	10.8749	10.8140	—
Durbin-Watson stat.	1.3354	1.3353 ^a	—
Observations	50	50	50

Note: p-values in parentheses. ^a Durbin-Watson computed within firm (differences taken only within each firm's own time series, not across firm boundaries). Random Effects estimates are numerically identical to Pooled OLS in this sample because the Swamy-Arora transformation parameter ϑ collapses to zero; Random Effects figures are reported for completeness only and are not used for inference.

Table 4.6 presents the panel regression results for the pooled OLS, fixed-effects, and random-effects estimators. Based on the Hausman specification test, the fixed-effects model was selected as the appropriate estimator for examining the effect of non-current assets on shareholders' value. Therefore, the interpretation of the findings is based on the fixed-effects estimates.

The results show that land and building (LNLB) has a positive and statistically significant effect on shareholders' value ($\beta = 51.9141$, $p = 0.0012$). This indicates that increases in investment in land and building are associated with improvements in shareholders' value, suggesting that this category of non-current asset contributes positively to value creation among listed oil and gas firms in Nigeria.

Plant and machinery (LNPM) has a negative and statistically significant effect on shareholders' value ($\beta = -20.5983$, $p = 0.0071$). This implies that increases in plant and machinery investment are associated with reductions in shareholders' value within the sampled firms. The finding suggests that investment in production-related assets

does not automatically translate into enhanced shareholder wealth unless such assets are efficiently utilised and generate sufficient economic returns.

The coefficient of motor vehicle assets (LNMV) is negative but statistically insignificant ($\beta = -18.8430$, $p = 0.1384$). This indicates that changes in motor vehicle assets do not have a significant independent effect on shareholders' value within the model. The result may partly reflect the close relationship between motor vehicle assets and plant and machinery, as identified in the multicollinearity diagnostics.

Intangible assets (LNIA) exhibit a negative and statistically significant effect on shareholders' value ($\beta = -18.3091$, $p = 0.0002$). This suggests that increases in intangible assets are associated with decreases in shareholders' value, indicating that intangible asset investments may not necessarily create value where the expected economic benefits are not realised.

The model has an overall explanatory power, with a within R-squared value of 0.5858, indicating that approximately 58.6% of the variation in shareholders' value within firms over time is explained by changes in the non-current asset variables included in the model after controlling for firm-specific effects. The findings demonstrate that different categories of non-current assets have varying implications for shareholders' value, with land and building contributing positively while plant and machinery and intangible assets require more careful management to ensure value creation

Post-Estimation Diagnostics

Table 4.7: Modified Wald Test for Groupwise Heteroskedasticity (Fixed Effects residuals)

Test Statistic	d.f.	Prob.	Decision
$\chi^2 = 43.8980$	5	0.0000	Reject H0: heteroskedasticity present

Table 4.8: Wooldridge Test for Serial Correlation in Panel Data

Coefficient on lagged Δ residual	H0 value	t-statistic	Prob.	Decision
-0.5054	-0.5000	-0.0413	0.9673	Fail to reject H0: no first-order autocorrelation

Table 4.9: Pesaran Cross-Sectional Dependence (CD) Test

Average pairwise residual correlation	CD statistic	Prob.	Decision
-0.0153	-0.1527	0.8787	Fail to reject H0: no cross-sectional dependence

The Modified Wald test rejects the null of homoskedasticity ($\chi^2(5) = 43.90$, $p = 0.000$), confirming the presence of groupwise heteroskedasticity.

The Wooldridge test does not reject the null of no first-order serial correlation ($t = -0.04$, $p = 0.9673$), and the Durbin-Watson statistic of approximately 1.34, correctly computed within each firm's own time series rather than pooled across firms, is consistent with this conclusion and falls close to the acceptable 1.5-2.5 range cited in the literature (Field, 2018).

The Pesaran CD test does not reject the null of cross-sectional independence ($CD = -0.15$, $p = 0.8787$), indicating no evidence that shocks to one sampled firm's shareholders' value are systematically correlated with shocks to another's, which is consistent with the firms' differing sub-segments within the oil and gas value chain.

Robustness Check: Excluding Oando Plc

To assess the sensitivity of the estimated coefficients to potential influential observations, the Fixed Effects model was re-estimated after excluding Oando Plc from the sample. Preliminary examination of the data revealed that Oando Plc exhibited characteristics that distinguished it from the other sampled firms. Specifically, it recorded negative shareholders' value during the study period, while the carrying value of its intangible assets increased from approximately ₦613.5 million in 2019 to about ₦622.4 billion in 2023, representing an exceptionally large increase relative to the other firms in the sample. These characteristics justified a robustness assessment to determine whether the baseline findings were unduly influenced by this firm's observations.

Table 4.10: Fixed Effects Regression Excluding Oando Plc (n = 40)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNLB	46.1654	6.3869	7.2281	0.0000
LNPM	0.5221	1.6159	0.3231	0.7487
LNMV	-1.8605	1.4066	-1.3226	0.1953
LNIA	0.8091	0.6142	1.3173	0.1971

The robustness results indicate that the positive and statistically significant effect of land and building on shareholders' value remains unchanged ($\beta = 46.1654$, $p < 0.01$), confirming the stability of this finding. However, the coefficients for plant and machinery, motor vehicle, and intangible assets become statistically insignificant following the exclusion of Oando Plc. This suggests that the estimated relationships for these variables are sensitive to the inclusion of Oando Plc, reflecting the influence of its distinctive financial characteristics on the baseline regression results. Accordingly, these findings are interpreted with caution and their implications are considered in the discussion of results, study limitations, and recommendations.

Test of Hypotheses

Table 4.11: Summary of Hypothesis Testing (based on selected Fixed Effects model, full sample)

Hypothesis	β (FE)	p-value	Decision
H01: Land and building has no significant effect on SHV	51.9141	0.0012	Rejected - significant positive effect
H02: Plant and machinery has no significant effect on SHV	-20.5983	0.0071	Rejected - significant negative effect
H03: Motor vehicle has no significant effect on SHV	-18.8430	0.1384	Not rejected - no significant effect
H04: Intangible assets have no significant effect on SHV	-18.3091	0.0002	Rejected - significant negative effect

Table 4.11 presents the summary of the hypothesis tests based on the selected fixed-effects model. The findings indicate that land and building has a positive and statistically significant effect on shareholders' value ($\beta = 51.9141$, $p = 0.0012$). Consequently, the null hypothesis (H01), which states that land and building has no significant effect on shareholders' value of listed oil and gas firms in Nigeria, is rejected.

The results further reveal that plant and machinery has a negative and statistically significant effect on shareholders' value ($\beta = -20.5983$, $p = 0.0071$). Therefore, the null hypothesis (H02), which states that plant and machinery has no significant effect on shareholders' value, is rejected.

Motor vehicle assets were found to have a negative but statistically insignificant effect on shareholders' value ($\beta = -18.8430$, $p = 0.1384$). Since the probability value exceeds the 5 percent level of significance, the null hypothesis (H03), which states that motor vehicle assets have no significant effect on shareholders' value, is not rejected.

Finally, intangible assets exhibited a negative and statistically significant effect on shareholders' value ($\beta = -18.3091$, $p = 0.0002$). Accordingly, the null hypothesis (H04), which states that intangible assets have no significant effect on shareholders' value of listed oil and gas firms in Nigeria, is rejected.

Discussion of Findings

The study found that land and building has a positive and significant effect on shareholders' value of listed oil and gas firms in Nigeria. This finding suggests that investments in land and building enhance shareholders' value by strengthening firms' productive capacity, providing collateral for financing, and supporting long-term operational efficiency. The result is consistent with the Agency Theory, which posits that managers create value for shareholders when corporate resources are allocated efficiently. The finding also agrees with Madukwe et al. (2022) and Onuigbo and Okafor (2024), who reported that investment in non-current assets contributes positively to firm value and financial performance.

The study also found that plant and machinery has a significant negative effect on shareholders' value. This implies that increased investment in plant and machinery may not necessarily translate into higher shareholders' value where such investments are accompanied by high acquisition costs, maintenance expenses, underutilisation, or inefficient asset management. Although these assets are essential for production, their contribution to shareholders' value depends on their ability to generate returns that exceed their associated costs. This finding is partially consistent with Emengini et al. (2023), who reported that certain categories of non-current assets may not positively influence corporate performance under all operating conditions.

Similarly, intangible assets were found to have a significant negative effect on shareholders' value. This finding indicates that investments in intangible assets may reduce shareholders' value where the expected future economic

benefits are not realised or where substantial expenditure on intangible assets does not translate into improved financial performance. The result is consistent with the Agency Theory, which suggests that managers' investment decisions may not always maximise shareholders' wealth when resources are committed to projects with uncertain or difficult-to-measure returns. The finding also aligns with Emengini et al. (2023), who observed that intangible asset investments do not always exert a positive influence on firm performance.

The findings further revealed that motor vehicle assets have no significant effect on shareholders' value. This suggests that motor vehicles constitute supporting operational assets whose contribution to shareholders' value is relatively limited when compared with more strategic categories of non-current assets such as land, buildings, and production facilities. Consequently, changes in motor vehicle investment do not significantly influence shareholders' value in the Nigerian oil and gas sector. This finding implies that managerial emphasis should be placed on the efficient utilisation of more productive long-term assets that have greater capacity to generate value for shareholders.

Summary of findings, Conclusion, Policy Implications and Recommendations

Summary of Findings

The findings of the study are summarised as follows:

- i. Land and building had a statistically significant positive effect on shareholders' value of listed oil and gas firms in Nigeria ($\beta = 51.9141$, $p = 0.0012$).
- ii. Plant and machinery had a statistically significant negative effect on shareholders' value of listed oil and gas firms in Nigeria ($\beta = -20.5983$, $p = 0.0071$).
- iii. Motor vehicle assets had no statistically significant effect on shareholders' value of listed oil and gas firms in Nigeria ($\beta = -18.8430$, $p = 0.1384$).
- iv. Intangible assets had a statistically significant negative effect on shareholders' value of listed oil and gas firms in Nigeria ($\beta = -18.3091$, $p = 0.0002$).

Conclusion

This study examined the effect of non-current assets on shareholders' value of listed oil and gas firms in Nigeria. The findings demonstrate that land and building has a positive and significant effect on shareholders' value, indicating that investment in this category of non-current assets contributes to long-term value creation and strengthens the financial position of firms. In contrast, plant and machinery and intangible assets were found to have significant negative effects on shareholders' value, suggesting that investments in these asset categories do not automatically translate into increased shareholder wealth and may reduce value where they are not efficiently utilised or managed. Motor vehicle assets, however, were found to have no significant effect on shareholders' value, implying that they make only a limited contribution to value creation within the sampled firms.

Therefore, the study concludes that not all categories of non-current assets contribute equally to shareholders' value. The ability of long-term assets to enhance shareholder wealth depends on their efficient acquisition, utilisation, management, and their capacity to generate future economic benefits. Consequently, investment decisions relating to non-current assets should be guided by their potential to improve operational performance and create sustainable value for shareholders.

Theoretical, Practical and Policy Implications

The findings of this study provide support for the Agency Theory by demonstrating that the value created from non-current assets depends largely on the efficiency of managerial investment decisions. While investment in productive tangible assets such as land and building enhances shareholders' value, inefficient allocation of resources to other long-term assets may reduce shareholder wealth. The study therefore reinforces the importance of prudent asset management in achieving the objective of shareholders' wealth maximisation.

Practically, the findings highlight the need for managers and boards of directors in oil and gas firms to adopt strategic investment decisions that prioritise long-term value creation. Greater emphasis should be placed on ensuring that investments in plant, machinery, and intangible assets are supported by sound economic justification, effective utilisation, and continuous performance evaluation. This will improve resource allocation and strengthen shareholders' confidence.

From a policy perspective, the study underscores the need for regulators, standard setters and external auditors to promote greater transparency and accountability in the recognition, valuation and reporting of non-current assets, particularly intangible assets. Strengthening compliance with financial reporting standards and improving asset valuation practices will enhance the reliability of financial statements and provide investors with more useful information for decision-making.

Recommendations

Based on the findings of the study, the following recommendations are made:

- i. Listed oil and gas firms in Nigeria should continue to make strategic investments in land and building, as these assets significantly enhance shareholders' value and support long-term organisational growth.
- ii. Management should ensure that investments in plant and machinery are guided by comprehensive cost-benefit analyses and effective asset utilisation strategies to maximise returns and minimise idle or underutilised capacity.
- iii. Firms should adopt prudent policies for the acquisition, recognition, valuation, and periodic review of intangible assets to ensure that such investments generate measurable economic benefits capable of enhancing shareholders' value.
- iv. Oil and gas firms should strengthen corporate governance mechanisms by regularly monitoring the performance of non-current assets and evaluating their contribution to shareholders' value, thereby improving investment decisions and resource allocation.
- v. Regulatory authorities, including the Securities and Exchange Commission and the Nigerian Exchange Group, should continue to strengthen oversight of financial reporting practices relating to non-current assets, particularly intangible assets, to improve transparency, accountability, and investor confidence in the Nigerian oil and gas sector.

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