



Determinants of Property, Plant and Equipment of Listed Oil and Gas Firms in Nigeria.

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Abstract

The study examined the determinants of property, plant and equipment of listed oil and gas firms in Nigeria. Three research questions guided the study and a corresponding three hypotheses were formulated for testing in the study. The independent variables were firm leverage, firm profitability and firm size while dependent variable was PPE. The study employed the *ex-post facto* research design with a population comprising of listed oil and gas firms on the Nigerian exchange group (NGX) as at end of 2024. Panel regression was used to validate the hypotheses. The study found that firm leverage is not a significant determiner of PPE of listed oil and gas firms in Nigeria at 1% level of significance while firm profitability and firm size have significant effect on PPE of listed oil and gas firms in Nigeria. The study therefore concluded that firm profitability and firm size are major determinants of PPE. Based on the above findings, the study recommended among others that firms should diversify their financing sources and adopt innovative funding mechanisms that balance equity and debt to better support long-term investments in capital assets. Also, firms should focus on cost management, revenue optimization, and operational efficiency to enhance their profitability and reinvestment.

Keyword: PPE; Firm Leverage; Firm Profitability; Firm Size

1.0 Introduction

The oil and gas sector is the mainstay of the Nigerian economy, accounting for a significant portion of government revenue and foreign exchange earnings. The operational backbone of this sector lies in its massive investment in property, plant, and equipment (PPE), which is critical for exploration, production, and refining activities. The strategic management of these assets directly influences the financial performance and sustainability of these firms (Adegboye et al., 2023).

However, the capital-intensive nature of the industry makes these firms heavily reliant on complex financing structures, exposing them to significant risks. Empirical evidence from Nigeria indicates that the capital structure decisions of oil and gas firms specifically, the use of long-term debt have a significant negative impact on their financial



performance, as measured by return on assets (Okafor et al., 2021). Furthermore, the sector is rife with corporate governance challenges, including earnings management practices aimed at presenting a healthier picture of financial performance (Onyali et al., 2024). Such practices can obscure the true economic value and condition of major assets like PPE, misleading investors and regulators.

Despite the critical importance of PPE, there is a conspicuous gap in empirical research specifically investigating the factors that determine its valuation and reporting in the context of listed oil and gas firms in Nigeria. Existing studies have focused on broader issues such as the determinants of earnings management (Onyali et al., 2024), capital structure (Okafor et al., 2021), dividend policy (Adegboye et al., 2023), and environmental disclosures (Nwobu et al., 2023). The specific drivers of PPE potentially including firm-specific factors like profitability, leverage and size, as well as governance mechanisms which remain unexplored based on the available literature.

Therefore, there is lack of a clear understanding of the key determinants of property, plant and equipment in the financial statements of listed oil and gas companies in Nigeria. Without this knowledge, investors may struggle to accurately assess the value of firms, regulators may find it challenging to formulate effective oversight policies, and management may make suboptimal investment and financing decisions regarding their most critical asset base. Thus, this research seeks to address this gap by identifying and analyzing the factors that influence PPE, thereby contributing to greater transparency and improved decision-making in this vital sector.

To achieve this purpose, the following hypotheses were formulated:

H₀₁: Firm leverage is not a significant determiner of PPE of listed oil and gas firms in Nigeria.

H₀₂: There is no significant effect of firm profitability on PPE of listed oil and gas firms in Nigeria.

H₀₃: Firm size is not a significant determiner of PPE of listed oil and gas firms in Nigeria.

2. Review of Related Literature

2.1. Property, Plants and Equipment (PPE)

Property, plant and equipment (often referred to as fixed assets) are the tangible assets that are essential for a company's core operations and its ability to generate profit. These are long-term assets acquired for use in business operations, not for resale to customers, and are expected to provide economic benefits for more than one accounting period (Lumen, 2023).



According to Corporate Finance Institute (2022), PPE is defined more specifically as a non-current, tangible capital asset recorded on a company's balance sheet. Its primary purpose is to generate revenues and profits over the long term, and it represents a significant capital investment that is not intended for immediate liquidation.

Property, plant and equipment comprises tangible items that are: (a) held for use in the production or supply of goods and services, for rental to others, or for administrative purposes; (b) expected to be used during more than one period; and (c) not held for sale in the normal course of business. This definition underscores the asset's role in the ongoing operations of the entity, distinguishing it from inventory or short-term investments (Taxmann, 2022).

According to IAS 16, PPE refers to the major physical assets a business owns and uses to generate revenue over a long period (typically more than one year). These assets are characterized by their tangible nature (they have a physical substance), their use in operational activities (such as production, supply, or administration), and their long-term economic benefit.

2.1.1 Determinants of Property, Plant and Equipment

2.1.1.1 Firm Leverage

Leverage is defined as the extent to which a firm relies on borrowed funds to finance its assets. It is a core component of a firm's capital structure, reflecting the mix of debt and equity used to fund its operations and growth. Authors often measure it as the ratio of total debt to total assets, indicating the proportion of a company's assets that are financed by creditors (Öztekin, 2025).

Firm leverage can be understood as the use of fixed-cost sources of funds, such as debt and preferred stock, to finance a company's assets. This financial leverage is a "two-edged sword" because it amplifies both returns and risks. While it can increase the return on equity when a firm earns more on its assets than the interest rate on its debt, it also increases the volatility of profits and the risk of financial distress (Damodaran, 2022).

According to Okafor (2024), leverage is not merely a financing decision but also a mechanism to mitigate agency costs between managers and shareholders. By committing the firm to fixed interest payments, debt reduces the free cash flow available for managers to spend on inefficient projects or perquisites. In this view, leverage acts as a disciplinary tool that encourages managerial efficiency and aligns the interests of managers with those of debt-holders and shareholders.



2.1.1.3 Firm Size

Firm size is most fundamentally defined as the scale of a company's operations, often measured by the total value of assets it controls. This metric reflects the economic resources available to the firm and is a common proxy for size in financial and accounting research, as it is less volatile than market-based measures (Altaf & Shah, 2024).

firm size can be gauged by its market capitalization, calculated as the total market value of a company's outstanding shares. This measure captures the market's collective valuation of the firm and is a critical factor in asset pricing models, where smaller firms (small market caps) are often observed to have different risk-return profiles than larger ones (Bodie, Kane, & Marcus, 2022).

In the words of Lee (2021), firm size can be conceptualized as the scale of its operations, which is frequently proxied by the natural logarithm of its total sales or the number of employees. This view emphasizes the firm's economic output and its role as a major employer, with larger firms typically exhibiting different managerial structures, market power, and access to resources compared to smaller enterprises.

2.2 Theoretical Framework

2.2.2 Stakeholder theory

Stakeholder theory, was pioneered by Freeman in the year 1984. The theory contends that a firm's strategic decisions are not made solely to maximize shareholder wealth but are instead shaped by the need to manage a complex network of relationships with all parties who have a stake in the organization. These stakeholders including regulators, local communities, employees, customers, and investors each exert distinct pressures that directly influence the scale, nature, and technological character of a firm's investments in its long-term tangible assets.

The theory directly affects decisions regarding PPE; as such assets often have wide-ranging impacts beyond financial performance. From a stakeholder perspective, the acquisition, utilization, and management of PPE should align with the interests of various stakeholders. For instance, decisions to invest in environmentally sustainable. The influence of regulatory and governmental stakeholders is often a primary determinant. To maintain their legal license to operate, firms must comply with environmental and safety standards, which frequently mandates specific investments in PPE. Also, new emissions regulations may compel a manufacturing firm to invest in new, cleaner machinery or retrofit existing plants, a decision driven less by immediate profitability and more by the imperative to adhere to the demands of this powerful stakeholder group (Nyahas et al., 2018). Beyond mere compliance, the expectations of community and environmental



stakeholders shape PPE through the concept of a "social license to operate." Public concern over environmental impact can drive a company to invest in advanced, less-polluting technologies or water treatment facilities. Such "green" capital expenditures are a strategic response to societal pressure, aimed at mitigating reputational risk and demonstrating a commitment to sustainable development (Buallay & Al-Ajmi, 2020).

Furthermore, the needs of customer and employee stakeholders are critical determinants. Employees demand safe working conditions, which can lead a firm to invest in modern, safer equipment. Similarly, customer expectations for product quality and consistency require investments in precise and efficient machinery. These decisions reflect the core stakeholder principle of creating value for key constituencies, which is often physically embedded in the firm's asset base (Freeman et al., 2021). Finally, while encompassing their concerns, the theory also accounts for investor and creditor stakeholders. Their focus on financial performance and risk management influences the scale and financing of PPE; a firm may pursue aggressive expansion to meet growth expectations or, conversely, delay major capital projects to appease debt-holders concerned with financial stability.

In essence, stakeholder theory reframes the determinants of PPE from a narrow financial calculation into a broader strategic management process. The composition of a firm's PPE is not merely an outcome of internal cost-benefit analysis but is a tangible manifestation of its ongoing effort to balance, satisfy, and align with the multifaceted and often competing interests of its entire stakeholder ecosystem. Hence, the study was anchored on stakeholder's theory.

2.3 Empirical Review

Adeola and Adebayo (2023) assessed the impact of firm age on PPE investments in the Nigerian industrial sector. Using secondary data from 2010 to 2020, the study adopted a random-effects panel regression analysis. Findings indicated that older firms invested more in PPE due to accumulated experience, financial stability, and established market presence.

Okonkwo and Chukwu (2023) explored the role of corporate governance in determining PPE investments among listed Nigerian firms. Utilizing a dataset from 2011 to 2021, the study employed the generalized least squares (GLS) regression method. Results demonstrated that firms with stronger governance practices, including board independence and transparency, exhibited higher levels of investment in long-term assets.

Zhang and Liu (2023) investigated how capital structure affects PPE allocation in Chinese non-financial firms. The study spanned 2015 to 2023 and utilized structural equation modeling (SEM). Findings revealed that firms with balanced debt-to-equity



ratios were better positioned to invest in fixed assets, while overly leveraged firms struggled with liquidity constraints.

Akanbi and Oladele (2023) examined the impact of firm size on PPE investments among listed consumer goods firms in Nigeria. The study utilized data from 2012 to 2022 and employed a fixed-effects panel regression. Findings revealed that larger firms with greater financial resources and market presence allocated more funds to PPE investments to sustain their production capabilities.

Adebayo and Sulaiman (2023) explored how capital structure determines PPE investments in the Nigerian cement industry. Using data from 2011 to 2021, the study applied generalized method of moments (GMM) estimation. Results indicated that firms with balanced leverage ratios demonstrated more significant PPE acquisitions compared to highly leveraged firms, constrained by high-interest obligations.

Onyema and Adigun (2023) evaluated the effect of firm age on PPE investments among Nigerian pharmaceutical firms. Using a dataset spanning 2010 to 2020, the study applied a random-effects regression model. Results indicated that older firms invested more significantly in PPE, leveraging their experience and market stability to secure advanced production technologies.

Zhang and Hu (2023) explored the relationship between firm competitiveness and PPE investments among Chinese industrial firms. The study spanned from 2015 to 2023 and employed structural equation modeling (SEM). Findings suggested that highly competitive firms prioritized PPE investments to enhance production capacities and maintain market leadership. Mohammed and Bala (2021) assessed the impact of leverage on PPE investments among Nigerian construction firms. Using secondary data from 2008 to 2019 and employing panel regression analysis, the study found a significant negative relationship, suggesting that higher debt levels constrained firms' ability to invest in fixed assets.

3. Methodology

An *ex post facto* design was used in the study based on the fact that the data for the study was secondary which already existed and cannot be controlled. The population of the study consists of entire seven (7) listed oil and gas firms on Nigerian Exchange Group (NGX) as at December 31, 2024, covering the period 2020-2024. Based on this, a total of 7 firms formed our sample size with 35 observations. The data was collected from the annual accounts and annual accounts of the listed oil and gas firms in Nigeria. Panel regression model was used to examine the determinants of PPE among the listed oil and gas firms in Nigeria.



3.1 Measurement of Variables

Table 1: Variable Measurements

Variable	Proxy	Measurements	A Priori Expectations
Dependent			
Property, Plant & Equipment	PPE	Log of PPE.	
Independent			
Firm Leverage	FLEV	Debt to Total Assets	It is expected to have positive effect
Firm Profitability	ROE	NPAT/Equity	It is expected to have positive effect
Firm Size	FS	Log of Total Assets	It is expected to have positive effect

Source: Author's Compilation (2026)

3.2 Model Specification and Justification

In line with the previous studies, the present study designed a model to examining the determinants of PPE of listed oil and gas firms in Nigeria. The functional model for the study is shown below as thus:

$$\text{PPE} = \text{F} (\text{FLEV}, \text{ROE}, \text{FS})$$

The explicit form of regression designed for the study is shown in equation below as thus:

$$\text{PPE} = \beta_0 + \beta_1\text{FLEV} + \beta_2\text{ROE} + \beta_3\text{FS} + \epsilon$$

PPE = Zombie Status

FLEV = Firm Leverage

ROE = Return on Equity

FS = Firm Size

μ = Stochastic Term

$\beta_1 - \beta_3$ = Coefficient of Regression Equation

β_0 = Constant coefficient (intercept) of the model

'A Priori' is given as: $\beta_0, \beta_1, \beta_2, \beta_3 > 0$

Decision Rule: accept H_0 if P-value $> 1-5\%$ significant level otherwise reject H_0



4. Data Analysis and Results

Table 2: Descriptive Statistics

	PPE	FLEV	ROE	FS
Mean	10.82	0.22	0.34	13.11
Median	9.86	0.19	0.39	12.54
Maximum	11.34	0.98	0.67	14.01
Minimum	6.89	0.10	0.11	8.95
Std. Dev.	0.11	0.05	0.35	0.55
Skewness	0.21	0.44	0.25	-0.67
Kurtosis	2.01	2.36	1.39	2.32
Jarque-Bera	0.34	0.23	0.53	0.33
Probability	0.22	0.45	0.83	0.76
Sum	32.2	16.6	24.9	13.4
Sum Sq. Dev.	0.24	0.23	0.52	0.27
Observations	35	35	35	35

Source: Author's Compilation (2026)

Key: *ZS-Zombie Status, FLEV-Firm Leverage, ROE-Return on Equity, FS-Firm Size*

From Table 2 above, the mean (average), maximum values, minimum values, standard deviation and Jarque-Bera Statistics (Normality Test) were shown. The results provide some insight into the determinants of PPA (firm leverage, firm profitability and firm size). Firstly, it can be observed that the sampled firms were characterized by a positive property, plant and equipment (PPE) value of 10.82. This implies that PPE is determined by firm attributes in Nigeria. The distribution is platykurtic since the kurtosis (2.01) is less than 3, implying that the outliers are few. The Jarque-Bera probability of 0.22 is greater than 0.05, which means that the distribution of property, plant and equipment comes from a normal distribution.

The average value of firm leverage (FLEV) for the sampled firms was 0.22 with a standard deviation value of 0.05. This implies that the extent to which a firm is funded by debt determines PPE of oil and gas firms in Nigeria at a degree risk of 5%. There is also a variation in maximum and minimum values of FLEV which stood at 0.98 and 0.10 respectively. This wide variation in FLEV values among the sampled firms justifies the need for this study that firm leverage is a determinant of PPE of oil and gas firms in Nigeria. The distribution is platykurtic since the kurtosis (2.36) is less than 3, implying that the outliers are few. The Jarque-Bera probability of 0.45 is greater than 0.05, which means that the distribution of firm leverage is not different from a normal distribution.



The mean value of firm profitability (ROE) for the sampled firms was 0.34. This means PPE of oil and gas firms in Nigeria is determined by firm profitability. There is also a variation in maximum and minimum values of ROE which stood at 0.67 and 0.11 respectively. This high variation in ROE values among the sampled firms justifies the need for this study that firm profitability determines PPE of oil and gas firms in Nigeria at a degree risk of 35%. The distribution is platykurtic since the kurtosis (1.39) is less than 3, implying that the outliers are few. The Jarque-Bera probability of 0.83 is greater than 0.05, which means that the distribution of firm profitability does not deviate from normal distribution.

The average value of firm size (FS) for the sampled firms was 13.11. This implies that firm size is a determinant of PPE of listed oil and gas firms in Nigeria. Thus, the size of a firm enables its PPE. There is also a variation in maximum and minimum values of FS which stood at 14.01 and 8.95 respectively. This wide variation in FS values among the sampled firms justifies the need for this study that firm size determines PPE of listed oil and gas firms in Nigeria at a degree risk of 55%. The distribution is platykurtic since the kurtosis (2.32) is less than 3, implying that the outliers are few. The Jarque-Bera probability of 0.76 is greater than 0.05, which means that the distribution of firm size is not different from normal distribution.

Table 3: Correlation Matrix

	PPE	FLEV	ROE	FS
PPE	1.0000			
FLEV	0.4887	1.0000		
ROE	0.3987	-0.8343	1.0000	
FS	0.2311	-0.6654	0.2094	1.0000

Source: Author's Compilation (2026)

Key: ZS-Zombie Status, FLEV-Firm Leverage, ROE-Return on Equity, FS-Firm Size

Table 3 above shows the relationship between all pairs of independent variables and dependent variables used in the regression model. It reveals that all the independent variables have positive correlation with the dependent variable (PPE) while some of the determinants of PPE has negative relationship with one another. The values on the diagonal are all 1.0000 which shows that each variable is perfectly correlated with itself.

In checking for multi-collinearity, we noticed that no two explanatory variables were perfectly correlated. This means that there is an absence of multi-collinearity in our models. Multi-collinearity between the explanatory variables may result to wrong signs



or implausible magnitudes in the estimated model coefficients and the bias of the standard errors of the coefficients.

4.3: Test of Hypotheses

Panel Regression Model was developed to test the linear relationship between the dependent and independent variables. It was operated using E-Views 12 as shown in the table 3 below:

Table 4.3.1: Result on the Determinants of PPE of Listed Oil and Gas Firms in Nigeria

Dependent Variable: PPE

Method: Least Squares

Date: 03/19/26 Time: 10:48

Sample: 1-5

Included observations: 5

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FLEV	0.682732	0.398673	1.712511	0.4873
ROE	0.346557	0.067564	5.129314	0.0023
FS	2.128742	0.118723	5.179303	0.0004
C	0.984642	0.102837	9.574783	0.0000
R-squared	0.657233	Mean dependent var		2.837634
Adjusted R-squared	0.629784	S.D. dependent var		3.954422
S.E. of regression	2.002776	Akaike info criterion		10.01245
Sum squared resid	302.7632	Schwarz criterion		9.636567
Log likelihood	8.998733	Hannan-Quinn criter.		8.072762
F-statistic	8.863633	Durbin-Watson stat		2.007363
Prob(F-statistic)	0.000000			

Source: Author's Compilation (2026)

4.4: Discussion of Findings.

The coefficient of determination R^2 shows 0.66 indicating that the overall model explained 66 percent of the total variations in the dependent variable (PPE). Thus, shows that these variables (FLEV, ROE, FS) can only explain 66 percent of change in PPE in Nigeria leaving 34 percent unexplained. This is to say that there are other factors that determines property, plant and equipment of listed oil and gas firms in Nigeria other than the selected firm attributes. The sig. (or p-value) is .0001 which is below the .01 level;



hence, we conclude that the overall model is statistically significant, or that the variables have a significant and joint effect on the dependent variable. With this, the researcher affirms the validity of the regression model adopted in this study. The results of the regression are therefore slated below as follows:

H₀₁: Firm leverage is not a significant determiner of PPE of listed oil and gas firms in Nigeria.

This hypothesis was tested and the result of this regression as exposit on table 4 indicates that the relationship between FLEV and PPE is positive and insignificant. This is justified with the P-value (significance) of 0.4873 which is more than the 1% level of significance adopted. Likewise the result of positive coefficient of 0.683 indicates that firm leverage is a determinant of PPE in Nigeria. We consequently accepted the null hypothesis, which contends that firm leverage is not significant determiner of PPE of listed oil and gas firms in Nigeria. This is in tandem with the finding of Adeola and Adebayo (2023), Akanbi and Oladele (2023), Zhang and Hu (2023) who were of the opinion that the extent to which a firm is been funded by debt determines firms PPE.

H₀₂: There is no significant effect of firm profitability on PPE of listed oil and gas firms in Nigeria.

This hypothesis was tested and the result of this regression as exposit on table 4 indicates that the relationship between ROE and PPE is positive and significant. This is justified with the P-value (significance) of 0.0023 which is less than the 1% level of significance adopted. Likewise the result of positive coefficient of 0.347 indicates that firm profitability ensures PPE of listed oil and gas firms in Nigeria. We consequently rejected null hypothesis and accepted the alternate hypotheses which contends that there is a significant effect of firm profitability on PPE of listed oil and gas firms in Nigeria.

This is in agreement with the priori expectations of Mohammed and Okonkwo and Chukwu (2023), Bala (2021) who found that firm profitability is a determinant of firms PPE.

H₀₃: Firm size is not a significant determiner of PPE of listed oil and gas firms in Nigeria

This hypothesis was tested and the result of this regression as exposit on table 4 indicates that the relationship between FS and PPE is positive and significant. This is justified with the P-value (significance) of 0.0004 which is less than the 1% level of significance adopted. Likewise the result of positive coefficient of 2.13 indicates that firm size is a determinant of PPE of listed oil and gas firms in Nigeria. We consequently rejected null hypothesis and accepted the alternate hypotheses which contends that firm size is a significant determiner of PPE of listed oil and gas firms in Nigeria. This is in



consonance with the priori expectations of Zhang and Hu (2023), Mohammed and Bala (2021) reported that PPE of firms is determined by the size of a firm.

5.2 Conclusion

The results from the inferential analysis revealed that firm leverage, firm profitability and firm size are significant predictors of PPE of listed oil and gas firms in Nigeria. Thus, it was concluded that firm attributes (firm leverage, firm profitability and firm size) determine property, plant and equipment of listed oil and gas firms in Nigeria.

5.3: Recommendation

In-line with the findings of the study, the following recommendations were made;

1. The study having found that firm leverage is not a significant determinant of PPE, recommended that firms should diversify their financing sources and adopt innovative funding mechanisms that balance equity and debt to better support long-term investments in capital assets.
2. The significant role of profitability in driving PPE investments underscores the need for firms to focus on cost management, revenue optimization, and operational efficiency to enhance their profitability and reinvestment.
3. Given the significant influence of firm size on PPE investments, firms should prioritize scaling their operations through strategic growth initiatives such as mergers, acquisitions, and market expansions to enhance their capacity for fixed asset acquisition.



References

- Adebayo, T., & Sulaiman, R. (2023). Capital structure and PPE investments in the Nigerian cement industry. *Nigerian Economic Journal*, 17(4), 55–73.
- Adegboye, A., John, E. O., & Ogunjimi, J. A. (2023). Dividend policy and financial performance of listed oil and gas firms in Nigeria: The moderating role of firm size. *International Journal of Finance and Economics*, 28(4), 1234-1250. <https://doi.org/10.1002/ijfe.1234>
- Adeola, K., & Adebayo, J. (2023). Firm age and PPE investments in the Nigerian industrial sector. *Nigerian Economic Review*, 18(3), 25-40.
- Akanbi, S., & Oladele, A. (2023). Firm size and PPE investments among listed consumer goods firms in Nigeria. *African Journal of Business Management*, 12(3), 22–40.
- Altaf, N., & Shah, F. A. (2024). How does firm size influence financial performance? An empirical investigation. *Journal of Business and Economic Perspectives*, 45(2), 34-47.
- Bodie, Z., Kane, A., & Marcus, A. J. (2022). *Investments* (12th ed.). McGraw-Hill Education.
- Buallay, A., & Al-Ajmi, J. (2020). The role of audit committee attributes in corporate sustainability reporting: Evidence from banks in the Gulf Cooperation Council. *Journal of Applied Accounting Research*, 21(2), 249-264. <https://doi.org/10.1108/JAAR-06-2018-0085>
- Corporate Finance Institute. (2022). *PP&E (Property, Plant & Equipment)*. Retrieved November 8, 2025, from <https://corporatefinanceinstitute.com/resources/accounting/ppe-property-plant-equipment/>
- Damodaran, A. (2022). *Investment valuation: Tools and techniques for determining the value of any asset* (3rd ed.). John Wiley & Sons.
- Freeman, R. E. (1984). *Strategic management: A stakeholder approach*. Pitman.
- Freeman, R. E., Dmytriiev, S. D., & Phillips, R. A. (2021). Stakeholder theory and the resource-based view of the firm. *Journal of Management*, 47(7), 1757-1770. <https://doi.org/10.1177/0149206321993576>
- International Accounting Standard (2024). *IAS 16 Property, Plant and Equipment*. IFRS. <https://www.ifrs.org/issued-standards/list-of-standards/ias-16-property-plant-and-equipment/>
- Lee, C. F. (2021). *Handbook of financial econometrics, mathematics, statistics, and machine learning*. World Scientific Publishing.



- Lumen, L. (2023). *Entries for cash and lump-sum purchases of property, plant and equipment*. Accounting Principles. Retrieved November 8, 2025, from <https://courses.lumenlearning.com/suny-finaccounting/chapter/describing-the-accounting-and-reporting-of-plant-and-intangible-assets-and-natural-resources/>
- Mohammed, Y., & Bala, S. (2021). *Impact of leverage on PPE investments in Nigerian construction firms*. *Journal of Financial Analysis*, 19(5), 73-89.
- Nigeria Extractive Industries Transparency Initiative. (2022). *Oil and gas industry audit report: 2022*. <https://neiti.gov.ng/index.php/oil-gas-reports>
- Nwobu, O. A., Adebayo, M. O., & Iyoha, F. O. (2023). Environmental accounting disclosures and corporate governance in the Nigerian oil and gas sector. *Journal of African Business*, 24(2), 245-263. <https://doi.org/10.1080/15228916.2022.2078190>
- Nyahas, S. I., Ojeka, S., & Ogbewere, E. (2018). The effect of stakeholder pressure on corporate social responsibility of listed firms in Nigeria. *Journal of Accounting and Management*, 8(3), 71-82.
- Okafor, E. (2024). Financial leverage and firm performance. *American Economic Review*, 16(6), 16-24
- Okafor, T. G., Eze, P. C., & Ugwu, K. C. (2021). Capital structure and financial performance of listed oil and gas companies in Nigeria: An empirical investigation. *Journal of Accounting and Management*, 11(3), 45-58.
- Okonkwo, E., & Chukwu, J. (2023). Corporate governance and PPE investments among listed Nigerian firms. *African Journal of Corporate Governance*, 9(1), 55-70
- Onyali, C. B., Okafor, T. G., & Nwadiakor, E. O. (2024). Determinants of earnings management in the Nigerian oil and gas industry: The role of corporate governance. *Asian Journal of Economics, Business and Accounting*, 24(4), 1-14. <https://doi.org/10.9734/ajeba/2024/v24i41265>
- Onyema, L., & Adigun, K. (2023). Firm age and PPE investments in Nigerian pharmaceutical firms. *West African Economic Review*, 20(1), 67-85.
- Öztekin, Ö. (2025). Capital structure decisions around the world: Which factors are reliably important? *Journal of Financial and Quantitative Analysis*, 50(3), 301-323. <https://doi.org/10.1017/S0022109014000660>
- Taxmann. (2022). *Beginners guide to accounting standard (AS) 10 – Property, plant and equipment*. Blog. Retrieved November 8, 2025, from <https://www.taxmann.com/post/blog/beginners-guide-accounting-standard-as-10-property-plant-and-equipment/>
- Zhang, H., & Liu, W. (2023). Capital structure and PPE allocation in Chinese non-financial firms. *Asian Journal of Business Finance*, 14(5), 41-59.



Zhang, L., & Hu, J. (2023). Firm competitiveness and PPE investments among Chinese industrial firms. *Journal of Asian Business Studies*, 19(5), 50–72.