



Asset efficiency and financial performance of listed non-financial firms in Nigeria

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ABSTRACT

This study explores the impact of asset efficiency on the financial performance of Nigerian listed non-financial firms. Total asset turnover ratio, non-current asset turnover ratio, inventory turnover ratio, and receivable turnover ratio were the asset efficiency indicators evaluated. Secondary data were gathered from the audited annual reports of the 40 non-financial firms sampled for this study for the period 2015-2022. Panel data least square multiple regression was used to test the hypotheses. According to the findings of this study, total asset turnover ratio, non-current asset turnover ratio, and inventory turnover ratio show a positive but statistically insignificant link with the financial performance of Nigerian non-financial firms. The findings, on the other hand, show that the turnover ratio and business size have a positive and statistically significant relationship with the financial performance of the firms analyzed. The study concludes that asset efficiency has a favorable effect on the financial performance of Nigerian non-financial firms. The study therefore, recommends among others that non-financial firms in Nigeria should efficiently maintain and use their different forms of assets to generate more income for the organization in order to promote higher financial performance.

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1 | INTRODUCTION

The financial performance of non-financial firms has piqued the curiosity, remarks, and attention of financial professionals, researchers and the general public. However, rating the most successful organizations has always been established to be a challenging assignment for many because a firm may have a high level of financial performance while also having difficulty managing its assets efficiently (Simbolon 2020). With the growth of the capital market, evaluating financial performance has become an important topic in finance. The purpose of financial metrics appears to be critical in assessing the firm's performance (Mahmoudi, 2013). According to Oguna (2014), financial performance analysis analyzes the firm's financial strengths and weaknesses by correctly establishing linkages between the components of the statement of financial position and income statement. This is accomplished by selecting the information relevant to the choice under discussion from the entire information contained in the financial statements, arranging the information so that critical relationships are highlighted, and interpreting and drawing inferences and conclusions. Asset management is one of the many aspects that influence the financial success of listed non-financial companies (Purba & Bimantara, 2020). According to Enekwe (2015), operational efficiency is one of the aspects on which an entity's financial performance is heavily reliant. As a result, this study sought to examine the relationship between asset efficiency and financial performance of Nigerian non-financial firms. Efficient asset management is a critical aspect in improving the financial performance of non-financial firms, which can transpose the sector to significantly contribute to the growth of the Nigerian economy. The method of administration of a firm's various forms of assets determines the success of its operations to a considerable extent (Maleya & Willy, 2013). Many firms neglect to analyze their investment in both non-current assets and current assets in their effort to maximize performance. This is regrettable because strengthening an organization's asset control and management may have the greatest potential for increasing its worth (İltaş and Demirgüneş, 2020). Asset management is one of the most significant aspects of a business in terms of creating value for shareholders.

In spite of the prominence of efficient asset management to non-financial firms' financial performance, the actual influence of asset efficiency on financial performance in Nigeria has been a key topic among scholars that has yet to be resolved. There is a disparity in the findings of prior studies, implying that there is still no definitive empirical evidence in the literature about how asset efficiency effects corporate performance of Nigerian enterprises (Azadi, 2013; Warrad & Omari, 2015). In light of this, the purpose of this research is to examine the relationship between asset efficiency and

financial performance of public listed non-financial firms in Nigeria covering periods from 2005 to 2020.

The following are the research questions addressed by this study:

- i. What is the impact of total asset turnover ratio on the financial performance of listed non-financial firms in Nigeria?
- ii. What is the impact of non-current assets turnover ratio on the financial performance of listed non-financial firms in Nigeria?
- iii. What is the impact of inventory turnover ratio on the financial performance of listed non-financial firms in Nigeria?
- iv. What is the impact of accounts receivable turnover ratio on the financial performance of listed non-financial firms in Nigeria?

Consequently, the following null hypotheses are formulated for the purpose of this study:

- H01: Total asset turnover ratio has no significant impact on the financial performance of listed non-financial firms in Nigeria.
- H02: Non-current asset turnover ratio does not have significant impact on the financial performance of listed non-financial firms in Nigeria.
- H03: Inventory turnover ratio does not have a significant impact on the financial performance of listed non-financial firms in Nigeria.
- H04: Account receivable turnover ratio has no significant impact on the financial performance of listed non-financial firms in Nigeria.

2 | LITERATURE REVIEW

2.1 | Asset Efficiency

Assets in accounting perspective can be referred to as a resource possessed by an entity as a result of past events and from which future economic advantages are expected to flow to the entity. Assets are typically classified into two types: tangible assets and intangible assets. The tangible assets are made up of non-current assets and current assets. According to accounting standards, intangible assets have specific conditions. As a result, the majority of the assets included in a company's statement of financial status are tangible assets. (Mawih, 2014) Non-current assets are used by listed non-financial companies to convert raw resources into finished items. Non-current assets in a business include land, premises, equipment, property, plant and equipment. On the other hand, current assets include cash, stocks, accounts receivable, prepayments etc. They are used in the day-to-day operations of businesses. Total assets are defined as the sum of current and non-current assets. Non-current assets and current assets, on the other hand, are becoming increasingly important in creating profit since most industrial enterprises invest extensively in the assets. The amount of money to be invested in both assets must be carefully calculated based on their

contributions to listed non-financial companies. As a result, asset efficiency is used to assess their contribution (Nurlaela, Mursito, Kustiyah, Istiqomah & Hartono 2019).

Asset efficiency, according to Warrad and Omari (2015), is a management ratio that measures the efficiency of managing all of the firm's assets. Asset efficiency is a financial concept used to assess how effectively a company manages and utilizes its assets. According to Enekwe (2015), an efficiency ratio is a turnover ratio that assesses the efficiency of the use of capital invested in assets by connecting the main naira volume of sales to the total assets employed in the business. He contended that the more the naira worth of sales per naira of invested capital, the greater the earnings on each naira invested in the business's assets. Because total assets comprise both non-current and current assets, the ratio is also a comprehensive indicator of capital efficiency. Similarly, Beinabaj, Soleimani, and Rashidi (2022) stated that assets efficiency ratio, also known as asset management ratio or asset turnover ratio, reflects a company's ability to effectively use its assets in income generating. They contended that a low ratio could be due to a variety of variables, and that it is critical to identify these factors and reasons. For example, are the invested assets overpriced in comparison to their production value (earnings)? In such a circumstance, the corporation may elect to sell further assets and invest in a more profitable location or sector. Meanwhile, asset efficiency ratios are critical for determining how successfully and efficiently a company manages its assets to generate revenue. Some businesses may have a higher proportion of non-current assets and a lower proportion of current assets, and vice versa. When the percentage of current assets is more than the percentage of non-current assets, it suggests that the contribution of current assets to sales is more likely to be greater than the contribution of non-current assets.

2.2 | Measurement of Efficiency

Numerous efficiency concepts and measurement techniques have been created throughout the previous century. According to Pieluigi (2014) technical efficiency, productive efficiency, allocative and X-efficiency, and cost and profit efficiency are some of the primary ideas of efficiency employed in business. He contended that, while management efficiency ratios are commonly utilized by analysts, it is still difficult to identify the concept of efficiency that they genuinely measure. Asset turnover ratios do not precisely measure productive efficiency because their calculation necessitates detailed figures on the amount of products expressed in various units of measurement, such as the number of products, kilograms, litres, and the cost of production for each type of good and service produced by a firm. Despite the range of efficiency concepts, this study does not evaluate a specific conception of efficiency, but rather employs financial measurements that are available to investors and frequently understood as proxies of efficiency in accordance with the technique used by financial analysts. Efficiency ratios, according to Qamariah (2020) also known as asset utilization ratios, include the accounts receivable turnover ratio, inventory turnover ratio, non-current asset turnover ratio, and total asset turnover ratio. Given the foregoing, this study will look at asset efficiency/management ratios as proxies for independent factors and financial performance as a dependent variable.

2.3 | Measurement of Financial Performance

According to Barus, Muturi, Kibati and Koima (2017), ratio analysis methodologies are used to examine a firm's performance. He noted that a ratio is used as a yardstick for analyzing a firm's financial position and performance, and that it is commonly and widely utilized in practice to measure enterprises' financial performance and condition. According to Almajali, Alamro, and Al-soub (2023), there are numerous financial performance ratios. The return on sales indicates how much a company earns in relation to its sales, the return on assets explains a company's ability to employ its assets, and the return on equity explains what investors expect for their investments. They contended that a company's performance can be measured in three ways. The first dimension is the company's productivity, or the efficiency with which inputs are converted into outputs. The second dimension is profitability, or the extent to which a company's earnings exceed its costs. The third dimension is market premium, which is the amount by which a company's market value exceeds its book value. In this study, the financial performance of non-financial firms will be examined in terms of profitability. A company has numerous goals, but "profit maximization" is believed to be the most important (Thuku 2015). Though the notion of "profit maximizing" has some inherent limits, it is preferable to wealth maximization. Profit is, nevertheless, a tool for efficient resource allocation because it is the most appropriate indicator of company performance under competitive market settings (Enekwe, 2015). Gross operating profit (GOP), net operating profit (NOP), return on assets (ROA), and return on equity (ROE) are the most widely used varieties as relevant measures of financial success (Gadzo, Anaman, Pobbi & Asiamah 2019).

Profitability is a critical factor for identifying a firm's financial status, based on this study. When a firm's financial performance is declining or poor

in comparison to other enterprises in the industry, it is deemed financially weak. Given the foregoing, the study decided to use return on asset (ROA) as a metric of financial performance. The ratio assesses a company's financial success by disclosing how much profit it earns with the assets invested by the firm. The greater such a ratio, the more efficient a firm's financial performance (Mustafa, 2014).

2.4 | System Theory

In the sphere of human knowledge, systems theory has a lengthy history. According to Shahid (2016), several scholars attributed the genesis of systems theory back to Aristotle. The concept of holism, which is important to systems thinking, is attributed by most scholars to the German philosopher Hegel, who asserted that the whole was larger than the sum of its parts. This concept holds that systems are made up of a number of interrelated and interconnected pieces. The system theory is divided into two parts. The earliest, known as closed systems, emerged from classical physics in 1949, created by Norbert Wiener and Ross Ashby. The other technique, known as the open systems approach, is derived from biology. The term general systems theory was coined in the 1940s by biologist Ludwig von Bertalanffy to characterize the basic principles and distinguish them from closed systems thinking. Chen, Lin and Liu (2018) stated that closed systems thinking was unsuitable for studying biological phenomena since biological systems interact with their surroundings, evolve, and survive. This study concentrates on the open system because non-financial firms cannot expand and exist unless they engage with their surroundings. The relationships between the parts are described by systems theory. Rather than breaking down an entity like the human body into its constituent components or elements (e.g., organs or cells), it focuses on the arrangement and relationships of the parts, as well as how they interact together as a whole. The qualities of a system are determined by how the pieces are structured and how they interact with one another. As a result, the system's behavior is determined by the attributes of the elements (Vasco, Feit, Bandres, Francis & Gips 2018).

The systems theory has a substantial impact on asset management and knowledge of an organization's operations. A listed non-financial system can be thought of as a collection of various assets that work together to achieve the overall goal of profit maximization. When one component of a system is removed, the nature of the system is altered. Mawih (2023) agreed with system theory, arguing that investing in non-current assets usually requires cash to be tied up in current assets such as inventory and receivables. As a result, investing in both non-current and current assets is a single activity that must be carried out concurrently. The importance of systems theory in this study is that it allows managers to take a broader view of asset management by allowing them to identify the various types of assets and, in specific, the interrelationships of the parts.

2.5 | Empirical Review

Numerous studies have been conducted in the field of working capital component management, with a few focusing explicitly on asset efficiency. Warrad and Omari (2015) carried out a study from 2009 to 2012 to assess the impact of turnover ratios on Jordanian service sector performance. Secondary data from annual financial reports was used in the study, which was then evaluated using regression methods. Return on asset and return on equity were used to assess financial success. According to the findings, turnover ratios had no substantial impact on the profitability of the sectors studied. Mawih (2023) conducted another study on the effects of asset structure (non-current assets and current assets) on the financial performance of some listed non-financial companies listed on the Muscat Securities Market, employing content analysis of annual reports from a sample of 28 out of 70 (40 percent) companies from 2008 to 2012. Non-current asset turnover and current asset turnover were used to assess asset structure, while return on assets and return on equity were used to assess financial performance. The study relied on two major hypotheses. The first looked at the impact of total asset turnover on ROA, while the second looked at the impact of total asset turnover on ROE. The study's overall findings demonstrated that asset structure had no significant impact on profitability in terms of ROA. According to the study's findings, only non-current assets have an impact on profitability in terms of ROE, as opposed to ROA.

The relationship between non-current assets and the profitability of a company was examined by Athar and Madhu (2023) using multiple regression analysis to assess 10 years of data from non-financial enterprises registered on the Kenya Stock Exchange. Their studies conclude that there is a link between non-current assets and corporate profitability. Enekwe, Okwo, and Ordu (2013) evaluated the association between financial ratio analysis and profitability in the Nigeria pharmaceutical business over the previous eleven (11) years, from 2001 to 2011. Secondary data were gathered from the financial statements of the selected listed pharmaceutical businesses and examined with the descriptive research approach and multiple regressions. The findings revealed that all independent variables have a negative connection with profitability in the Nigerian pharmaceutical industry. It also

reveals that the debtors' turnover ratio, creditors' velocity, and total assets turnover ratio have no meaningful link with the company's profitability, but only the inventory turnover ratio does. From 2006 to 2010, Jamali and Asadi (2012) examined the link between management efficiency and profitability of 13 auto listed non-financial companies listed on the Bombay Stock Exchange. One of the ratios utilized to assess managerial efficiency was asset turnover. According to the data, there is a strong association between profitability and management efficiency.

Kotsina and Hazak (2012) examined the impact of investment intensity on return on assets as defined by the percentage of non-current assets to total assets. The survey included 8,074 enterprises from six European Union (EU) member countries over a nine-year period from 2001 to 2009. According to the study's findings, there is no significant detrimental (or positive) influence of a company's investment intensity on future rate of return on assets. Azadi (2013) examined the effects of changes in assets (both non-current and current) on operating earnings of Tehran Stock Exchange-listed enterprises. To evaluate these impacts, the researchers utilized Ordinary Least Squares (OLS). The results reveal that non-current assets have a positive and significant influence on operating earnings in the food and metal industries, whereas current assets have no significant beneficial effect on operating earnings in the chemical industries. Okwo, Ugwunta, and Nweze (2012) examined how a company's investment in non-current assets affects its operating profit margin. The study gathered information from the financial accounts of the tested companies in the Nigerian brewery sector from 1999 to 2009. The regression statistical method was used to evaluate the data. According to the findings, there is a non-statistically significant positive association between non-current asset investment and operational profit. The study found no significant positive impact of non-current asset investment on the operating profit of Nigerian beer enterprises.

Okpo and Duru (2015) examined the impact of accounts receivable management on the profitability of Nigerian building materials/chemical and paint industries. The information was gleaned from the annual reports of the companies under consideration. Multiple regression was used to test the hypotheses. The findings indicate that accounts receivable has a favorable and significant impact on the profitability ratio. Gorondtse and Ali (2016) evaluated the impact of trade receivables and inventory management on Malaysian SMEs' profitability. For the investigation, a sample of 66 SMEs Non-financial firms from 2006 to 2012 was used. To assess the association between independent and dependent variables, ordinary least squares (OLS) regression is utilized. Days account receivable and inventory turnover in days are found to be negatively connected to SME profitability proxies such as return on assets (ROA), return on equity (ROE), and net operating profit (NOP). As a result, the profitability of SME non-financial firms is dependent on effective working capital management. The study conducted by Baveld (2012) on the relationship between profitability and accounts receivables throughout the global crisis period is worth mentioning. It is the study that looked into how listed companies in the Netherlands managed their working capital. The non-crisis period of 2004-2006 was compared to the financial crisis period of 2008-2009. During the non-crisis period, the study found a statistically significant negative relationship between accounts receivable and gross operating profit. During the crisis era, however, no substantial relationship between these two factors is detected. This finding implies that the relationship between accounts receivable and business profitability changes during a crisis, such that some firms need not keep their accounts receivables at a minimum in order to optimize profitability during a crisis.

Etale and Bingilar (2016) examined the impact of inventory cost management on the profitability of Nigerian listed consumer goods companies. Inventory cost management proxies such as raw material cost, work in progress cost, and finished goods cost were regressed against profitability proxies such as gross profit margin. Secondary time series data acquired from the Nigeria Stock Exchange's annual reports and accounts of selected beer companies from 2005 to 2014. The data acquired from the Nigerian Stock Exchange was analyzed using the multiple regression technique. According to the findings of the study, efficient inventory cost management has a favorable impact on the profitability of Nigerian brewery enterprises. Prempeh (2015) examined the influence of efficient inventory management on the profitability of Ghanaian non-financial firms, employing raw material inventory management and profit as independent and dependent variables. Ordinary Least Squares (OLS) and multiple regression approaches were used to analyze cross-sectional data from the annual reports of four non-financial firms listed on the Ghana Stock Exchange. According to the findings, there is a considerable and positive association between raw material inventory management and profitability. Using the multiple regression technique, Abdulraheem, Yahaya, Isiaka, and Aliu (2011) examined the impact of inventory management on the performance of small enterprises in Nigeria. According to the findings of the study, inventory management has a significant positive impact on profitability among Nigerian small firms.

There have also been studies on the correlation between firm size and financial performance. Sciarelli, Tani, Landi and Turriziani (2020) examined the influence of business size on the performance of firms trading on the Istanbul Stock Exchange from 2000 to 2005. According to the findings of the study, large-scale enterprises outperform small scale firms. In a similar vein, Mutegea (2016) examined the relationship between profitability and firm size in Iceland. According to the findings of the investigation, larger firms are more profitable than smaller firms. However, given the knowledge of other researchers' points of view and observations on the subject of research gathered through a review of previous similar studies, it is critical to map out the actions required in the course of this study. According to Kimani (2013) and Makinde (2021) a conceptual framework is a presenting model in which the researcher conceptualizes or diagrammatically illustrates the relationship between variables of interest to assist the reader rapidly see the proposed relationship. In light of this, Figure 2.1 depicts the link between the study's independent variables, control variables, and dependent variables.

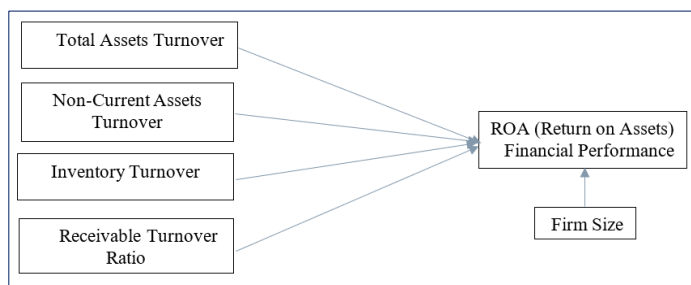


Figure 1: Conceptual Framework

2.6 | Research Gap

The review of existing literature discloses that asset management has become noticeable among financial experts, researchers and corporate entity management, with significant empirical efforts made on asset efficiency measures and their effect on the financial performance of non-financial firms in Nigeria. However, it is obvious that the majority of these studies conducted in Nigeria focused solely on the influence of current asset management and working capital management, ignoring the effect of non-current assets and total assets, resulting in a conceptual study vacuum. This omission may be significant because efficient non-current asset management is one of the most critical components of the overall business organization in creating value for shareholders. Because the financial data obtained and analyzed for this study provided adequate information on these variables, this study delved into evaluating the effect of asset efficiency on the financial performance of listed non-financial firms in Nigeria using total asset turnover ratio, non-current asset turnover ratio, inventory turnover ratio, and receivable turnover ratio as proxies for asset efficiency.

3 | METHODOLOGY

3.1 | Research Design

This study used Ex-post factor research design. This was chosen since the study concerns the data of past events. Total asset turnover ratio, non-current asset turnover, inventory turnover ratio, accounts receivable turnover ratio, company size, and return on equity are the variables examined in the study. The population of the study consisted of 96 listed non-financial firms from ten subsectors that were listed on the Nigerian Stock Exchange (NSE). Due to incomplete and unavailability of data, a convenient sample of 40 listed non-financial firms from 8 subsectors was chosen from the population for analysis. The study began by selecting all listed non-financial firms, a total of 96 firms, and then proceeded to delete firms whose data were not up to date or delisted between 2005 and 2022. This process resulted in the selection of 40 firms. The analysis relied solely on secondary data taken from the financial statements of the selected listed non-financial firms. The items used in this study include turnover, cost of goods sold, receivables, inventories, profit after tax, non-current assets, total assets, and equity capital.

3.2 | Measurement

The study's dependent variable is business financial performance as assessed by Return on Assets (ROA). The ROA measures the return on capital given by equity holders. Muia (2015). The following formula is used to compute the ratio:

$$\text{ROA} = \frac{\text{Earning after interest and tax}}{\text{Total Assets}}$$

In terms of independent variables, total assets turnover ratio, non-current assets turnover ratio, inventory turnover ratio, and accounts receivable ratio are used to assess asset management efficiency.

The ratio assesses how well a company manages its overall investment in assets to generate sales. It is an overall activity metric that compares sales to total assets (Nweze, 2011). In general, a high total assets turnover ratio implies efficient asset management and use in producing revenue, whereas a low ratio suggests inefficient asset management and utilization. The ratio is given below:

$$\text{Total Asset Turnover Ratio} = \frac{\text{Net Turnover}}{\text{Total Assets}}$$

The ratio assesses the effectiveness of long-term investment (Mawih, 2014). In general, a high non-current assets turnover ratio implies efficient asset usage in producing revenue, whereas a low ratio shows inefficient non-current asset management and utilization. The ratio is given below:

$$\text{Non-current Asset Turnover Ratio} = \frac{\text{Net Turnover}}{\text{Non-current Assets}}$$

The ratio counts the number of times a company's inventories are sold and replaced in a given year (Nweze, 2011). A high inventory turnover ratio implies efficient asset management in producing revenue, whereas a low ratio suggests poor inventory management and use. The ratio is given below:

$$\text{Inventory Turnover Ratio} = \frac{\text{Cost of goods sold}}{\text{Average Inventory}}$$

It measures the efficiency of the firm's credit policies and indicates the level of investment in receivable needed to maintain the firm's sales level (Pandey, 2010). Generally, a high receivable turnover ratio indicates efficient utilization of the asset while a low ratio indicates inefficient management and utilization of receivables. The ratio is given below:

$$\text{Receivable Turnover Ratio} = \frac{\text{Net Turnover}}{\text{Average Trade Receivables}}$$

3.3 | Control Variable

The size of the firm is the study's control variable. The study controlled the variable in order to determine the net effect of asset efficiency in Nigerian non-financial firms. Total assets were utilized as a proxy for firm size, which was calculated as a logarithm of total assets (Niresh & Velnampy, 2014).

3.4 | Model Specification

The regression model used by Enekwe is used in this study (2015). This model aided in testing the study's stated hypotheses and fulfilling the previously mentioned objectives.

The practical description of this study's model is as follows:

$$ROA = f(TATR + NTR + ITR + RTR + FS)$$

The econometric description is as follows:

$$ROA_{it} = b_0 + b_1TATR_{it} + b_2NTR_{it} + b_3ITR_{it} + b_4RTR_{it} + b_5FS_{it} + e_{it}$$

Where:

ROA = Return on Assets (Proxy for financial Performance)

TATR = Total Assets Turnover Ratio

NTR = Non-current Assets Turnover Ratio

ITR = Inventory Turnover Ratio

RTR = Receivable Turnover Ratio

FS = Firm's Size

b₀ = Intercept for X variable of firms

b₁- b₅ = Coefficients for the explanatory variables of firms

e_{it} = u_i + v_{it} (one-way error component model)

u_i = The unobservable individual specific effect of the cross-sectional unit

v_{it} = The stochastic disturbance term

i = individual unit in a cross section (listed firms)

t = time dimension.

4 | RESULTS AND DISCUSSIONS

4.1 | Descriptive Statistics

Table 1: Descriptive Statistics Results

Variables	Minimum	Maximum	Mean	Std
Return on Assets	-5.53	3.24	0.1763	0.4624
Total Asset Turnover Ratio	0.69	12.50	1.3381	1.3441
Non- Current Asset T/ Ratio	0.13	18.43	7.3178	14.118
Inventory Turnover Ratio	2.23	21.25	5.3335	3.4288
Receivables Turnover Ratio	4.36	58.52	14.472	17.135
Firm Size	4	10.05	6.8691	0.5406

Source: Researcher's Computation, 2023

According to Table 1, the average return on assets of the listed non-financial sector in Nigeria is 17.63 percent, with a minimum of -5.53 percent and a maximum of 324 percent, and a standard deviation of 46 percent, indicating that the return on assets deviates significantly from the mean to both sides by 46 percent among non-financial firms operating in Nigeria. The descriptive statistics also show that asset efficiency, as measured by total assets turnover ratio (TATR), non-current asset turnover ratio, inventory turnover ratio (ITR) and receivables turnover ratio (RTR), has mean values of 1.33, 7.32, 5.33 and 14.47, with standard deviations of 1.34, 14.12, 3.43, and 17.14, respectively. This demonstrates a fairly wide range of asset turnover ratios across the studied firms. The mean value of total asset turnover and non-current asset ratios revealed that the sector generates N1.34 and N7.31 in sales for every N1 of total assets and non-current assets held. Inventory and receivables turnover ratios with average values of 5.33 and 14.47 indicate the number of times inventory and receivables were changed over into sales and cash throughout the year. The control variable, company size, is measured by log of total assets and has a mean value of 6.87 with a minimum value of 4 and a maximum value of 10.05, with a standard deviation of 54.06 percent. This means that the size of the selected listed non-financial firms in the sub-sector differs by 54.06 percent.

4.2 | Multi-collinearity Test

When employing the panel least squares estimation method, an implicit assumption is made that the independent variables are not absolutely or nearly perfectly associated with one another. If the explanatory variables have no relationship with one another, they are said to be orthogonal to one another.

Table 2: Variance Inflation Factor

Variable	VIF	1/VIF
TATR	1.22	0.5376
RTR	1.14	0.3268
FS	1.23	0.7421
NTR	1.17	0.8165
ITR	1.06	0.7472
Mean VIF	1.26	

Source: Researcher's Computation, 2023

Table 3 depicts the link between the study's independent variables and control variables using the variance inflation factor (VIF). The results show that there is no multicollinearity among these variables, as demonstrated by the VIF of each variable being less than 10, and the average VIF being less than 10.

4.3 | Regression Analysis

The following table shows a description of each independent variable in relation to the dependent variable (ROA):

Table 3: Regression result on effect of asset efficiency on financial performance of non-financial firms in Nigeria

Variable	Pooled OLS	Fixed Effect Model	Random Model	Effect
Constant	-1.5201 (0.000)***	0.1513 (0.557)	-1.0876 (0.030)**	
TATR	0.0449 (0.040)*	-0.0078 (0.839)	0.0341 (0.414)	
NTR	0.0786 (0.310)	0.0015 (0.582)	0.0053 (0.364)	
ITR	0.0173 (0.441)	0.0281 (0.121)	0.1422 (0.264)	
RTR	0.0193 (0.022)**	0.0165 (0.036)***	0.0147 (0.004)***	
FS	0.2564 (0.030)***	-0.0552 (0.642)	0.1342 (0.044)*	
F-Statistic	5.457 (0.0042)***	3.77 (0.0026)***		
R Squared			0.4225	
Wald X2			17.33 (0.0065)***	
Hausman Test			5.88 (0.3552)	
Breusch and Pagan Lagrangian Multiplier Test			25.42 (0.0000)***	

Source: Researcher's Computation, 2023

*, ** and *** denote 10%, 5% and 1% level of significance.

The choice of whether to use the fixed effects (FE) model or the random effects (RE) model for this study was determined by whether the individual effects were fixed or random. The Hausman test was used to determine which model is best between fixed effects and random effects. The Hausman test result of 5.88 confirmed that the random-effects model is adequate, as evidenced by a prob 0.3552 greater than 1% level of significance.

Furthermore, the study used the Breusch and Pagan Lagrangian multiplier test to assess whether model is acceptable between the pooled OLS model and the random effects model, with the outcome confirming that random effects is appropriate as indicated by prob 0.0000 at the 0.1 significant level. As a result, Table 4 displays the results of the pooled OLS, fixed-effects, and random-effects models on the effects of asset efficiency measures on the financial performance of selected Nigerian listed non-financial firms. The Wald X² (17.33) and P-value 0.0065 suggest substantial statistical significance at the 1% level of significance, enhancing the model's dependability and validity. The table also shows that R² = 0.4225, indicating that the independent variables' explanatory power is 0.4225. This suggests that the model explains around 42% of the variation in financial performance and leaves the remaining 58% unaccounted for. This is understandable given that the model did not account for other factors influencing the financial performance of listed non-financial firms.

5 | DISCUSSION ON FINDINGS

H01: Total asset turnover ratio has no significant impact on the financial performance of listed non-financial firms in Nigeria.

The magnitude and p-value of total asset turnover ratio clearly have a positive but insignificant effect on financial performance assessed in terms of return on assets. As a result, the efficiency obtained in managing total assets has little effect on the financial performance of Nigerian non-financial firms. In other words, it suggests that increasing investment in total assets by Nigerian non-financial firms, given their current level of efficiency, will have no meaningful influence on return on equity. This findings is congruent with that of Warrad and Omari (2015) as well as Mburu (2017), who discovered that non-financial firms are not employing their overall assets efficiently in order to generate higher financial performance. However, the findings of this study do not agree with similar studies conducted by Jamali and Asadi (2012) and Azadi (2013), who establish a positive and statistically significant impact of total asset turnover on financial performance, stating that non-financial firms use total assets efficiently in generating better financial performance. As a result, this study accepts the hypothesis that total asset turnover ratio has no substantial impact on the financial performance of Nigerian non-financial firms.

H02: Non-current asset turnover ratio has no significant impact on the financial performance of listed non-financial firms in Nigeria.

The magnitude of coefficient and p-value of non-current asset turnover ratio clearly have a positive but minor effect on financial performance assessed in terms of return on assets. As a result, the efficiency gained in managing non-current assets has little effect on the financial performance of Nigerian non-financial firms. This implies that, at the existing level of efficiency, increasing investment in non-current assets by Nigerian non-financial firms will have no effect on return on equity. The findings are consistent with prior research by Kotsina and Hazak (2012) and Okwo et al. (2012), who concluded that investing in non-current assets has no substantial influence on return on asset or equity. This study's conclusions contradict those of Athar and Madhu (2012), Azadi (2013), and Mawih (2014), who found a statistically significant association between non-current asset efficiency and financial performance of non-financial firms. Their findings suggest that investing in non-current assets increases financial performance, showing that non-financial firms manage their non-current assets efficiently in order to generate appropriate revenues, which could lead to improved financial performance. Based on these findings and discussions, this study accepts the hypothesis that non-current asset turnover ratio has no substantial effect on the financial performance of Nigerian non-financial firms.

H03: Inventory turnover ratio has no significant impact on the financial performance of listed non-financial firms in Nigeria.

Hypothesis 3 indicates that the inventory turnover ratio has no substantial impact on the financial performance of Nigerian non-financial firms. Based on the regression results in Table 4, the magnitude of coefficient and p-value of inventory turnover ratio have a positive but insignificant effect on financial performance measured in terms of return on assets. As a result, the level of efficiency gained in inventory management has little effect on the financial success of Nigerian non-financial firms. This finding is consistent with Azadi (2013) and Terefe (2019) who discovered a positive but insignificant association between inventory efficiency and financial performance, implying that non-financial firms are not managing inventories efficiently in order to generate improved financial performance. The findings of this study, on the other hand, do not agree with previous but similar studies conducted by Abdulraheem et al., (2011); Etale and Bingilar (2016) who found a positive and statistically significant impact of inventory management on financial performance, implying that non-financial firms are utilizing inventories efficiently in generating better financial performance. As a result, this study accepts the hypothesis that the inventory turnover ratio has no

substantial influence on the financial performance of Nigerian non-financial firms.

H04: Receivable turnover ratio has no significant impact on the financial performance of listed non-financial firms in Nigeria

According to Hypothesis 4, receivable turnover ratio has no substantial impact on the financial performance of Nigerian non-financial firms. According to the regression results in Table 4, the magnitude and p-value of receivable turnover ratio clearly have a positive and significant effect on financial performance measured in terms of return on assets. This suggests that effective receivable management will improve financial performance when measured in terms of return on assets. In other words, improved receivables management efficiency has a beneficial impact on the financial performance of Nigerian non-financial firms. This finding is consistent with Okpo and Duru (2015) and Kilonzo and Njeru (2016), who found a positive and statistically significant relationship between receivable efficiency and financial performance, implying that non-financial firms manage receivables efficiently in order to generate higher financial performance. The findings of this study, on the other hand, contradict similar studies conducted by Ksenija (2013) and Oluwaremi and Memba (2016), who finds a positive but statistically insignificant impact of receivable efficiency measure on financial performance, indicating that non-financial firms are utilizing receivable efficiently in generating higher financial results. As a result, this study rejects the hypothesis that receivable turnover ratio has no substantial influence on the financial performance of non-financial firms in Nigeria and admits that the two variables have a significant positive correlation.

6 | CONCLUSION

The importance of effective asset management cannot be overstated. Furthermore, sufficient asset investment is critical because it has a robust impact on corporate financial success. This study examined the relationship between asset efficiency and financial performance of Nigerian non-financial firms from 2015 to 2020. Some promising investments with high rates of return have proven to be stinkers, particularly during the period of economic downturn. Many businesses have been shuttered, either temporarily or permanently, and many Nigerian workers have been forced into the labor market. Despite the fact that asset management is thought to be critical for non-financial firms' survival, little attention has been paid to how non-financial firms use and manage their many types of assets to affect their financial performance. This is precisely what this study sought to address by evaluating the effects of various asset efficiency techniques on the financial performance of Nigerian non-financial firms. A number of logical conclusions have been reached based on the empirical evidences and outcomes of the analyses. As a result, the study suggests that asset efficiency, notably the receivable turnover ratio, has an enormous and favorable effect on the financial performance of Nigerian non-financial firms. This viewpoint was made clear by inference statistics, which confirmed the existence of a substantial effect with a p-value less than 1% level of significance.

6.1 | Recommendations

Based on the study's findings, the following recommendations are proffered:

- i. Management of Nigerian non-financial firms should efficiently use their different forms of assets to generate more income for the organization and promote higher financial performance. This is because efficient asset management in all forms will result in a higher overall asset turnover ratio.
- ii. To improve the performance of non-financial firms, non-current assets should be managed efficiently. Management should prioritize investments in non-current assets and ensure that excess productive capacity within their firms is used effectively and productively in order to improve performance for the benefit of equity holders.
- iii. Management should implement optimal inventory management techniques in which the firm's inventory is checked and monitored on a regular basis by the department in charge of the assignment in order to avoid inventory shortage or overstocking of obsolete goods.
- iv. Management should preserve and intensify the receivables turnover ratio by expanding on their solid credit system, which minimizes opportunity costs while increasing revenues associated with retaining receivable balances. This will assist them in boosting their investment by reinvesting the monies acquired from their consumers and subsequently leading to improvement in their financial performance.

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