

ASSET STRUCTURE AND PROFITABILITY OF LISTED MANUFACTURING FIRMS IN NIGERIA

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ABSTRACT

This study was undertaken to examine the effect of asset structure on the profitability of listed manufacturing firms in Nigeria. It covered the period of 10 years from 2013 to 2022 and employed causal-comparative research design. From the target population of twenty (20) listed manufacturing firms in the consumer goods and industrial goods sectors of the Nigerian Exchange Group, the study utilized purposive sampling technique to select a sample of fifteen manufacturing firms. It gathered data from the annual reports of the sampled firms and analyzed with the aid of E-Views 10. It formulated four hypotheses and tested them by estimating fixed and random effect models which have return on assets and return on capital employed as dependent variables. Tangible non-current assets and current assets were the independent variables. The study revealed that tangible non-current assets have significant positive effects on return on asset and return on capital employed of the sample. It also found that current assets have significant positive effects on return on assets and return on returns on capital employed of the sample. Based on the finding of the study, it was recommended that the management of manufacturing firms in Nigeria should sustain the asset structure in place. The study suggest future studies should use more proxies of asset structure and profitability and longer sample period.

Keywords: Asset Structure, Tangible Non-current Assets, Current Assets, Profitability. Nigerian Exchange Group

JEL Classification Code: L25, M41

1. INTRODUCTION

Profit maximization is a mandatory requirement for any business organization that wants to maintain its going concern status to the pleasure of its promoters, investors and its management (Pandey, 2015). To attain profit maximization requires appropriate asset structure and efficient utilization of the assets. Asset structure is the proportions of various types of assets held by a firm. The literature defines asset as resources owned and controlled by firms (IASB, 2010). Assets are classified as into two broad categories, non-current assets and current assets. A company's asset structure helps to determine the way in which finance is raised, in particular the balance of long-term loans and short-term debt. This holds significant consequences on liquidity and profitability (Eljelly; 2004; Deloof, 2003). Asset structure varies amongst firms and industries. For instance, large manufacturing company are likely to have proportionately large non-assets, while retail companies are likely to have proportionately large current assets.

Previous studies provided mixed evidence of the effect of asset structure on profitability. Mwangi *et al.* (2014) established that asset structure influenced profitability negatively. Kadubo *et al.* (2019), in their study, revealed that profitability of companies was positively affected by asset structure. Wamiori *et al.* (2016) studied asset structure and performance and indicated that performance is essential in every enterprise manager or its owner of the interest the organizational management scholars and policymakers. The mixed results therefore, create motivation for this study to contribute to the literature. The specific objectives of this study are:

- i. Assess the effect of tangible asset on return on asset of listed manufacturing firms in Nigeria.
- ii. Determine the influence of tangible assets on return on capital employed of listed manufacturing firms in Nigeria.
- iii. Evaluate the effect of current assets on return on assets of listed manufacturing firms in Nigeria.

- iv. Ascertain the influence of current assets on capital employed of listed manufacturing firms in Nigeria.

The rest of this paper proceeds as follows. Section 2 presents a review of related literature and put forward hypotheses. The methodology of the study is outlined in Section 3 followed by Results and Discussion of Findings in Section 4. Section 5 marks the conclusion of the paper.

2. REVIEW OF RELATED LITERATURE

2.1 Conceptual Review

Asset Structure

Asset structure is the proportions of various types of assets held by a firm (Saleh, 2018). There are two broad categories of assets – non-current assets and current assets (IASB, 2010). Assets are resources owned and controlled by a firm. IAS (2010) defines assets as present economic resources controlled by an entity as a result of past events. It goes further to define economic resources as rights which have the potential to produce economic benefits. The emphasis is control. An entity controls an economic resource if it has the present ability to direct the use of the economic resource and obtains the economic benefits that may flow from it.

Non-current assets are long lived assets and cannot be converted into cash quickly, and the realization of its benefits lasts more than a year. They are recorded at acquisition cost in the Statement of Financial Position and comprise of tangible assets such as property, plant and equipment, and intangible assets such as patents, copyrights, franchises, licenses, goodwill, software, and trademarks (Udeh, 2017). Non-current assets in the form of tangible assets, assets are assets in a physical form. They form an essential part of a company's core operations. Tangible non-current assets constitute a major form of assets in the financial statements of many industries (Udeh, 2017). Tangible non-current assets are capital intensive and hence expected to last for more than one accounting year. Often times, tangible non-current assets account for over eighty percent of the total assets available for a manufacturing firm (Lyandres & Palazzo, 2016). The degree to which a firm invests in plant and equipment, land and building, motor vehicles and its relationship to the total asset value of the firm is often times referred to as asset tangibility (Almeida &

Campello, 2007). The tangible non-current assets employed in this research are plants and machineries, land and buildings and motor vehicles.

Current assets are assets whose useful economic life is usually one financial year. They are deployed in the day-to-day operation of the firm. Examples of currents found in the Statement of Financial Position of manufacturing firms include inventories, Trade and other receivables, Prepayments, and Cash and cash equivalents. Low investment in current assets could lead to liquidity problem with serious consequences on business survival, sustainability profitability (Duru *et al.*, 2014). On the other hand, a high proportion of current assets helps to eliminate the risk of inability to meet short term commitments, and delay in payment to suppliers (Li *et al.* 2020). However, excessive investment in current assets suggest high level of idle funds which may generate low return thereby affecting profitability (Li *et al.* 2020; Yameen *et al.* 2019). Therefore, effective allocation of funds to non-current and current assets is vital for firm profitability, survival and growth (Baafi *et al.*, 2020; Kajola *et al.*, 2020). Akomeah & Frimpong, 2019; Duru *et al.*, 2014).

Profitability

This describes the extent to which a firm attains its goal in terms of profit. In simple term, profit is the excess of revenue over expenses. The literature measures profitability using different indices including return on assets, return on capital employed, gross profit margin, net profit margin, earnings per share among others (Chukwu & Wadike, 2018; Penman, 2013). Return on assets measures the efficiency of management in utilization of assets to generate returns to shareholders. It is computed either as profit before tax divided by total assets. It is computed as earnings before Interest and Tax divided by Capital Employed. Capital employed is derived as total assets minus current liabilities. A high ratio of return on assets and return on capital employed denotes high profitability.

2. 2 Theoretical Review

Pecking Order Theory

The Pecking order theory was first suggested by Donaldson (1961) and later modified by Myers (1984), and Myers and Majluf (1984). The theory maintains that businesses adhere to a hierarchy of financing sources starting with internally generated funds and proceeding to external financing in the form of debt financing and equity

financing. This hierarchy aims to minimize costs due to information asymmetry. Related to external financing, debt issuance is favored compared to equity issuance due to the lower information cost of debt and adverse selection effect of equity issuance (Demirgüneş, 2016).

This theory points out that because of information asymmetry between managers and investors about the firm's investment opportunities, the market may undervalue a firm's new shares relative to the value that would be assessed if managers' information about their firm's investment opportunities were revealed to the market. Thus, issuing new shares may harm existing shareholders through value transfer from old to new shareholders.

The Pecking Order Theory of capital structure suggests that if a firm is profitable, then it is more likely that financing would be from internal sources rather than external sources. A profitable firm is likely to have greater retained earnings than less profitable peers. Such firms tend to use retained earnings which are internally generated funds first for financing its asset investment before resorting to external financing. From the perspective of pecking order theory, the value of tangible assets affects the capital structure debt, because tangible assets can easily be pledged as collateral thereby facilitating greater access to debts, without being forced by situation to issue equity (Koralun-Bereźnicka, 2013). There are advantages in financing with debt such as the tax benefits of debt. This in turn may translate to higher financial performance. Based on the above discussions and the fact that investment decisions, funding decisions, asset management to achieve improved financial performance cannot be separated from each other, Pecking Order Theory of capital is considered appropriate for this study. Anuar *et al.* (2021), Mwaniki and Omagwa (2017) amongst others applied Pecking Theory in their respective Malaysian and Indonesian studies.

2.3 Empirical Review

Nworie *et al.* (2023) studied the contribution of current assets management to the financial performance of listed consumer goods firms in Nigeria. Purposive sampling technique was deployed to determine the sample size of twelve (12) consumer goods firms out of a population of twenty-one. Secondary data were obtained from the annual reports and accounts of the selected companies over a period of ten years

which spanned from 2011 to 2020. It tested formulated hypotheses using Ordinary Least Square technique. The findings revealed that while debtor turnover ratio and inventory turnover ratio have a positive effect on earnings per share, cash ratio negatively affected the Earnings per Share of listed consumer goods firms on the Nigerian Exchange Group. However, the effects were not significant at 5% level.

Enekwe *et al.* (2023) explored the effect of non-current assets on financial performance of a sample of twenty (20) consumer goods manufacturing firms listed on the Nigerian Exchange Group from 2010 to 2019. The analyzed data retrieved from the annual reports of the sample using E-Views version 9.0. The results from Ordinary Least Square Regressions showed that non-current assets have a significant effect on return on assets of the sample.

Okobo *et al.* (2022) analyzed the relationship between investment in tangible non-current assets on financial performance of food manufacturing firms in Nigeria. Based on data of twenty (20) firms in the period 2008 to 2020, the study ran multiple linear regression analysis. Findings revealed that non-current assets have significant effect on the financial performance of the sample.

Guided by ex post facto research design, Harvest *et al.* (2022) assessed the effect of current asset investment on the financial performance of five (5) listed industrial goods manufacturing firms in Nigeria. The study obtained data from the annual reports of the selected firms for the years 2010 to 2020. It tested the formulated hypotheses by estimating Ordinary Least Square Regression Model. The findings revealed a significant negative effect of inventories on return on assets, a positive but insignificant effect of trade receivables on return on assets, and a significant positive effect of cash and cash equivalent on return on assets.

Chukwu *et al.* (2022) analyzed the effect of asset investment decisions on corporate performance. The study focused on the effect of non-current asset investment, current asset investment and asset intangibility the on the profitability and liquidity of firms in the agricultural sector in Nigeria. Using ex-post facto research design, and the entire population of five (5) listed agribusiness firms listed on the Nigerian Exchange Group, and data from for seven years (i.e. 2013-2019), subjected to multivariate analysis, the study documented that non-current asset investment and asset

intangibility had a significant effect on both profitability and liquidity of agricultural firms.

Prasetio *et al.* (2021) conducted a study on the effect of total assets turnover, current ratio and financial technology on the profitability of banking companies in Indonesia. The population used was 44 conventional banks and a sample of 4 banks listed on the Indonesia Stock Exchange. Multiple linear analysis techniques using EVIEWS 11 was employed to analyze the data in order to determine the relationship between variables. The results of the partial test (T-test) showed that the Total Assets Turnover variable does not have a positive and significant effect on profitability measured by return on assets. Current Ratio variable has a positive and significant effect on profitability while and the Financial Technology variable has a negative and significant effect on banking profitability. The simultaneous test results (Test F) showed that the variables Total Assets Turnover, Current Ratio, and Financial Technology have significant effect on bank profitability.

Bama *et al.* (2021) studied the effect of total asset turnover and profitability on firm value with good corporate governance as moderating variable in food and beverage subsector manufacturing companies listed on the Indonesia Stock Exchange (IDX) 2010-2019. The population is food and beverage companies listed on the Indonesia Stock Exchange for 2010 – 2019. From this population of 26 firms, the study used 14 companies producing 140 firm-year observations. The did the analysis of secondary with help of EViews10 software. The results of Panel Data Regression Analysis indicated that profitability has a positive and significant influence on firm value. It was also found that total asset turnover has a positive but statistically insignificant effect on firm value. Further findings indicated that while good corporate governance strengthened the influence of profitability on firm value, good corporate governance failed to moderate the effect of total asset turnover on firm value.

Anuar *et al.* (2021) undertook an analysis of the impact of non-current assets on the performance of firms in the construction sector of Malaysia. The study covered the period 2011 to 2017 and applied panel data regressions technique. The results observed a significant positive impact of fixed asset turnover on both return on assets and return on equity. Total assets turnover showed a significant positive impact on

only return on return on equity while asset tangibility presented no impact on both return on assets and return on equity.

Ani (2014) examined the effects of assets structure (fixed assets and current assets) on the financial performance of a sample of 28 manufacturing companies listed on Muscat Securities Market in the period 2008-2012. The asset structure was measured by fixed assets turnover and current assets turnover while the financial performance was measured by return on assets (ROA) and return on equity (ROE). The overall result for the study was that the structure of assets has no strong impact on profitability in terms of ROE.

Okwo *et al.* (2012) investigated the impact of non-current assets investment on the profitability of Nigeria Brewery sector for eleven-year period from 1999 to 2009. The study which adopted ex-post facto design obtained data from the annual reports and accounts of four listed breweries. Findings from the result of ordinary least square multiple regression, findings revealed that there positive but insignificant Relationship between non-current assets investment and operating profits of selected brewery firms in Nigeria.

Based on the above review, this study formulated the following hypotheses:

- H01:** Tangible asset does not have significant effect on return on asset of listed manufacturing firms in Nigeria.
- H02:** Tangible asset has no significant impact on return on capital employed of listed manufacturing firms in Nigeria.
- H03:** Current asset does not have significant effect return on asset of listed manufacturing firms in Nigeria.
- H04:** Current asset does not have significant impact on capital employed of listed manufacturing firms in Nigeria.

3. METHODOLOGY

The study employed causal-comparative research design. The non-probability sampling method of purposive sampling was adopted. From the target population of twenty (20) manufacturing firms in the consumer goods and industrial goods sectors of the Nigerian Exchange Group as at December 31st 2022, the study adopted purposive sampling technique which is a non-probability sampling method to

determine a sample size of fifteen manufacturing firms. In applying the purposive sampling technique, the set the following criteria which firms must satisfy to be included in the sample: (a) each company must have complete annual financial report in study period running from 2013 to 2022 (b) the annual financial reports must complete data on all the variables required for analysis; and (c) the firms must be active on the NGX.

The study used secondary data in the annual financial reports of firms sampled. It adopted descriptive statistics, and inferential statistics such as correlation analysis and regression analysis in carrying out data analysis. The study stipulated the following regression equations to test the effect of asset structure on profitability of listed manufacturing firms in Nigeria.

$$ROA_{i,t} = \alpha_0 + \alpha_1 TNCA_{i,t} + \alpha_2 CA_{i,t} + \alpha_3 FSZ_{i,t} + \epsilon_{i,t} \quad (1)$$

$$ROCE_{i,t} = \beta_0 + \beta_1 TNCA_{i,t} + \beta_2 CA_{i,t} + \beta_3 FSZ_{i,t} + \epsilon_{j,t} \quad (2)$$

Where for firm i in year t , ROA is return on assets, ROCE is return on capital employed, TNCA is tangible non-current assets, CA is current assets, FSZ is firm size, and ϵ is error term. ROA and ROCE are the dependent variables while TNCA and CA are the main independent or explanatory variables of interest. FSZ is a control variable. ROA is calculated as profit before tax divided by total assets. ROCE is computed as profit before tax divided by capital employed. Capital employed is total assets minus current liabilities. TNCA is the book value of non-current assets divided by total assets. CA is book value of current assets divided by total assets. FSZ is calculated as the natural logarithm of total assets. The decision rule is to reject each null hypothesis if the coefficient of TNCA/ CA is significant at the not more than 0.05 level, otherwise accept alternative hypothesis.

4. RESULTS AND DISCUSSION OF FINDINGS

Table 4.1 presents the descriptive statistics of dependent and independent variables. Descriptive statistics provide information concerning the basic characteristics of the data, such as the mean, standard deviation, skewedness, kurtosis and normality. It also enables the researcher to make comparative assessment of the variables under study.

Table 4.1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
roa	200	0.0744475	0.1010155	-0.1339673	0.5395941
roce	200	0.1466268	0.2513245	-1.155694	1.45812
tnca	200	0.4991313	0.2268457	0.1013427	1.182939
ca	200	0.4172045	0.1976277	0.0265264	0.8848197
fsz	200	17.15628	1.880817	12.67941	20.01189

Source: Researchers' Computation, 2024.

In Table 4.1, TNCA and CA have mean of 0.4991313 and 0.4172045 while the values of standard deviation are 0.2268457 and 0.1976277 respectively. This indicates that on average manufacturing firms hold more tangible non-current assets than current assets. The respective mean of ROA and ROCE are 19.23% and 25.19%. The mean of ROA and ROCE are 0.0744475 and 0.1466268. The standard deviation of ROCE stands at 0.2513245 and this is higher than the mean suggesting ide dispersion amongst the sample.

The study performed correlation analysis to determine the degree and direction of association between pairs of variables. Table 4,2 displays the results. Table 4.2 indicates that TNCA is positively and significantly correlated with all the dependent variables whereas CA has a significant negative correlation with all the dependent variables. The correlation coefficients between the independent variables and dependent variables are all less than 0.40, except for that between TNCA and CA which is 0.73. These low coefficients suggest less likelihood of the existence of multicollinearity between the independent variables (Gujarati & Porter, 2009).

Table 4.2: Correlation Matrix

	Roa	roce	tnca	ca	fsz
roa	1.0000				
roce	0.9057*	1.0000			
tnca	0.3083*	0.3976*	1.0000		
ca	-0.2620*	-0.2396*	-0.7297*	1.0000	
fsz	-0.1843*	-0.0971	-0.0161	0.0853	1.0000

*Indicates 5% level of statistical significance.

Source: Researchers' Computation, 2024.

Table 4.4: Results of LM Test and Hausman Test

	Model 1 (ROA)		Model 2 (ROCE)	
	LM Test	Hausman Test	LM Test	Hausman Test
Chi square statistic	362.35	3.48	300.99	1.15
d.f	1	3	1	3
Prob > chibar2	0.0000	0.3228	0.0000	0.7646

Source: Researchers' Computation, 2024.

The study estimated Model 1 and Model 2 by employing panel regression technique. Panel data regression analysis accounts for unobserved heterogeneity in the data thereby providing in-dept analysis (Cameron & Trevidi, 2010; Gujarati & Porter, 2009). In line with the literature, the study first conducted Breusch and Pagan Lagrangian Multiplier Test (LM Test) and Hausman Specification Test to determine the choice between the Pooled Regressions, Fixed Effects Model (FEM) and Random Effects Model (REM) (Cameron & Trevidi, 2010; Gujarati & Porter, 2009). If the probability value of the Chi square statistic of LM Test is less than or equal to 0.05, Pooled Regression is rejected in favour of REM. Then if Chi square statistic of Hausman Specification Test is less than or equal to 0.05 the REM is rejected and FEM becomes the preferable choice. The results of the Hausman Specification Tests are shown in Tables 4.3

In Table 4.3, the p-value of LM Test is 0.000. Therefore, Pooled regressions are rejected for estimating Model 1 and Model 2 respectively in favour of REM. The results of Hausman Test as shown in Table 3 provide a p-value of Chi square statistic of 0.3228 for Model 1 and 0.7646 for Model 2. Consequently, the study rejected FEM and adopted REM for estimating Model 1 and Model 2. Table 4 contains the results estimation of the empirical models based on REM. Table 4 reports the results based on standard robust errors. The use of standard robust errors is to mitigate the issue of heteroskedasticity. In Table 4, the independent variables explain 15% of the variations in ROA and 20% variations in ROCE. The probability value of Wald chi square statistics is 0.0000 for the respective models, indicating a high goodness of fit of the models. The coefficient of TNCA in Model 1 is positive and significant ($\alpha_1 = 0.1214$, p-value = 0.006). Since the p-value is not greater than 0.005, H_0 is rejected. TNCA in Model 2 has a positive coefficient ($\beta_1 = 0.5045$) and the p-value is 0.001. Consequently

Ho₂: is rejected. Model 1 in Table 4 reveals that CA has a positive coefficient ($\alpha_2 = 0.0441$) and a p-value of 0.158. The p-value leads us to accept Ho₃ which states that current asset does not have significant effect return on asset of listed manufacturing firms in Nigeria. From Model 2 of Table 4 it was observed that CA has a positive coefficient ($\beta_1 = 0.2120$) and p-value of 0.010. Based on the p-value. The study therefore rejects Ho₄. Ho₄ states that current asset does not have a significant impact on capital employed of listed manufacturing firms in Nigeria.

The positive coefficients of TNCA suggest that a percentage increase in TNCA is associated with 12.5% and 51% increase in ROA and ROCE respectively, all things being equal. The relationship is highly significant at the 1% level. This is consistent with the a priori expectation and implies that an increase in the tangible non-current asset composition of listed manufacturing firms in Nigeria enhances profitability. These findings support Enekwe *et al.* (2023), Chukwu and Egbuhuzor (2017) who found a significant positive relationship between plant and machinery and return on assets of manufacturing firms in Nigeria but diverges slightly from Okwo *et al.* (2012) who found an insignificant effect of fixed assets on the profitability of brewery firms in Nigeria. The significant positive effect of tangible non-current asset on financial performance is due to the fact that the production efficiency of a firm, especially manufacturing firms, depends on the quality of the plants and equipment utilized in the production process; even though they so not generate any direct income to the firm. Thus, tangible non-current assets indirectly stimulate financial performance. The positive coefficient of CA in Model 1 of Table 4 is not significant indicating that CA has no significant impact on ROA. This aligns with Ani (2014). From Model 2 of Table 4 it was observed that CA has a positive coefficient ($\beta_1 = 0.2120$). This implies that holding other variables constant, a percentage increase in CA is associated with 21% increase in ROCE. This relationship is statistically significant (p-value = 0.010). The result is in agreement with Prasetio *et al.* (2021) who found a significant effect of current ratio on profitability. However, it runs counter to Harvest *et al.* (2021) who showed that inventories have a significant negative effect on profitability. The probable reason for this is that an increase in the current assets implies an increase in the operating activity of the manufacturing firms, which invariably leads to increased profitability. The control variable, FSZ, in both Model 1 and Model 2 has negative coefficients and they are not statistically significant.

Table 4. Results of Estimation of the Empirical Models

Variable	Model 1 (ROA)				Model 2 (ROCE)			
	Coef.	Robust Std. Err	Z	p-value	Coef.	Robust Std. Err	z	p-value
tnca	0.1214	0.0442	2.75	0.006	0.5045	0.1478	3.41	0.001
ca	0.0441	0.031	1.41	0.158	0.2120	0.0823	2.58	0.010
fsz	-0.0161	0.0130	-1.24	0.214	-0.019	0.0300	-0.63	0.528
Cons	0.2566	0.2353	1.09	0.275	0.0405	0.5318	0.08	0.939
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of obs		200					200	
Number of groups		20					20	
Obs per group: min		10					10	
avg		10					10	
max		10					10	
Wald chi2(12)		140.23					112.91	
Prob > chi2		0.0000					0.0000	
R-sq: within		0.2480					0.1989	
between		0.1015					0.2023	
overall		0.1472					0.1998	

Source: Researchers' Computation, 2024.

5. CONCLUSION AND RECOMMENDATIONS

This study was undertaken to examine the effect of asset structure on the financial performance of listed manufacturing firms in Nigeria. The specific objectives of the study were to determine the extent to which tangible non-current assets and current assets influence the returns on assets and return on capital employed of the selected listed manufacturing firms in Nigeria. In line with the objectives of the study, four hypotheses were formulated. Guided by Pecking Order Theory, the study adopted ex post factor research design, obtained data from annual reports of fifteen manufacturing firms listed on the NGX in a 10-year period, 2013 to 2022. It analyzed the data using descriptive and inferential statistic. From the results of panel data regression analysis, it was found that both Tangible Non-current Assets and Current Assets have significant positive effects on both return on assets and return on capital

employed of the listed manufacturing firms in Nigeria. The study therefore concluded that asset structure enhances profitability of listed manufacturing firms in Nigeria.

In consideration of the findings and conclusions made in this study, it is recommended that the management of manufacturing firms in Nigeria should continue to maintain a significant proportion of their assets in the form of tangible non-current assets and current assets. It is suggested that future studies should consider more proxies of asset structure and profitability and longer sample period.

Competing Interest: The authors declare that there is no competing or conflicting interest in this manuscript.

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