



RESEARCH ARTICLE

Impact of Biological Assets on the Valuation of Agricultural Firms in Nigeria**Nzeagwu, Chinonyerem Emmanuel^{1*} & Okoye Nkiruka Cecilia²**^{1&2}*Department of Accountancy, University of Nigeria Enugu Campus, Nigeria****Corresponding Author****ABSTRACT**

The study examined impact of biological assets on the valuation of Agricultural firms in Nigeria. Biological assets are subject to high market price fluctuations resulting from the influence of the economy, climate, diseases, pests, etc. More so, previous discussions on fair value valuation have gathered critics and defenders. Some parties believe that farm accounting benefits investors while others believe it hurts investors. The study specifically examined the effect of; biological assets measurement of property, plant and equipment and biological assets measurement of biological assets in form of long term loan or debenture on return on assets of agricultural firms in Nigeria. Five research questions and hypotheses were developed in line with the specific objectives. The study adopts an ex-post facto research design. The population of the study comprises all five (5) agriculture firms listed on the floor of the Nigerian Exchange Group as of 31st December 2023. Out of these, four (4) firms were selected and used as the sample for the study. The analysis revealed that the measurement of biological assets under property, plant, and equipment has a positive and significant effect on the return on assets of agricultural firms in Nigeria. It further showed that biological assets in the form of long-term loans or debentures also have a positive and significant effect on return on assets. Based on these findings, the study recommends that firms in the agricultural, food, and beverage sectors focus on refining their measurement practices related to biological assets. This includes adopting advanced and accurate methods to assess the impact of these assets on property, plant and equipment, long-term financing, investments, and intangible assets.

Keywords: Biological Assets; Valuation; Agricultural Firms; Fair Value; Long-term Loan; Debenture; Return on Assets; Nigeria

Introduction

Agriculture is an essential sector in the global economy because the vital economic role of a country is based on this sector. International Accounting Standards Board (IASB) issued a regulation to manage the agriculture activity through IAS 41. Agriculture issued in December 2000 and it became effective on financial report from January 2003 (Lindo, 2018). Generally, this standard in accounting treatment measures and discloses agricultural activities such as biological assets, agricultural products, and government grants (Nickolas, 2015).

Between 1990-2010, a relevant concern was raised on the Nigerian forest sector with 1.065 increase in the sector. Nigeria has vast natural resources with extreme economic level arising from her agricultural sector. Nigerian agriculture sector plays an essential role in this regard.

Intense domestic and international competition drives companies to demonstrate sustainable financial performance (Adika, 2015). In practice, the achievement of companies financial performance in the agricultural sector is that the forestry sector is very much influenced by the accounting policies of the forest plant assets (Daum, 2015). Banks and methods of defining biological assets and agricultural products make accurate and transparent valuations, accounting possibilities.

It should be noted that in whatever way the value can be defined (depending on the availability or absence of an active market), the method of determining the value must be reflected in the accounting policies developed in accordance with International financial Reporting Standard (IFRS). The valuation of biological assets and agricultural products with fair value can be adjusted. However, the recommended method makes evaluating performance results more accurate, transparency of information in financial statements and company efficiency (Firer and Williams, 2013). Biological assets are usually must be valued at the time of acquisition and at the end of each reporting period using fair value fewer costs to sell (IAS 41 par. 12). The difference in profit or loss on the valuation

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of biological assets is recognized as part of the current year profit and loss. From the various phenomena above and based on the information and financial reports, the poor performance of several agricultural companies in Nigeria is closely related to the production forest management with historical valuation rather than fair value, (Garger and John, 2010) said that valuations using fair value must consider the balance among benefits and costs.

Agricultural production defines plants and animal species by their biological properties. It needs a lengthy time to convert these resources in ultimate value. The best developments obtained by using current engineering machines and instruments may reduce the time required for the product transformation and lead to quick growth via the use of invention and research. By this, asset turnover and greater profit are accelerated. At the first acknowledgement and end of each reporting period, bio assets are assessed by their fair value at lower selling costs. Fair value minus expenses sells at the moment of sale or at the time of harvest and is evaluated by agricultural goods derived from biological assets. Initial acquisition prices that do not have market-determined prices or are entirely inaccurate alternative fair value estimations are valued by their buy price – i.e., less accumulation of depreciation costs and expected selling expenses. A grouping of biological assets or agricultural goods based on key features such as age and quality may help the establishment of fair value of biological assets or agricultural goods. For price fixing the manufacturer picks the criteria which match to the market qualities. Economic method which justifies investment in agricultural processes is necessary as a universal value of biological asset. In order to get competitive goods, the manufacturer takes judgments for the selection of investment capital in production, technology and innovation. In the public sector, financial incentive spending supplied by ministries and endorsed by Government is of the utmost importance since it offers extra funding to agriculture that results in quicker growing and increasing agricultural produce.

Financial reporting standard issued by ASC is mostly in line with IFRS standard. Ninety-five percent of IFRS standards are adopted by ASC. The implementation of IFRS based standard in Singapore has a positive effect on stakeholder's trust because IFRS adoption is considered to increase comparability of annual reports between companies that operate in Singapore and companies that operate outside Singapore. The previous study also has been conducted in other countries other than Nigeria. The study is conducted by Kamath, (2015). The study discusses the accounting system in Vietnam and other countries in South East Asia, including Thailand. It against this knowledge gap that this study tends to examine impact of biological assets on the valuation of Agricultural firms in Nigeria.

Statement of the Problem

Fair value measurement of assets and liabilities is one of the controversial topics in financial reporting; with the agricultural sector not an exception. Until the adoption of International Accounting Standard (IAS) 41 in 2003 which established the accounting treatment with respective disclosure for biological assets and agricultural products, less concern was being paid by researchers and accounting standard regulators on accounting for agricultural activities due to its relative lack of importance to the global economy. Fritsch and Mallok (2015) noted that before the adoption of IAS, current accounting principles had not been responding maximally to some characteristics of agricultural businesses and the information needs of farmers and their stakeholders, thereby resulting to poor performance of the sector.

Biological assets are subject to high market price fluctuations resulting from the influence of the economy, climate, diseases, pests, etc. More so, previous discussions on fair value valuation have gathered critics and defenders. Some parties believe that farm accounting benefits investors while others believe it hurts investors. This study consequently, tends to critically analyze impact of biological assets on the valuation of Agricultural firms in Nigeria.

Objectives of the Study

The main objective of the study is to determine the impact of biological assets on the valuation of Agricultural firms in Nigeria. The specific objectives are:

- i. Ascertain the effect of biological assets measurement of property, plant and equipment on return on assets of Agricultural firms in Nigeria
- ii. Evaluate the effect of biological assets measurement of biological assets in form of long-term loan or debenture on return on assets of Agricultural firms in Nigeria

Scope of the Study

The focus of the study is on impact of biological assets on the valuation of Agricultural firms in Nigeria for ten (10) years (2014 to 2023). Data were collected from the quoted agricultural firms in Nigeria.

Review of Related Literature

Conceptual Review

Biological Assets

The accounting of biological assets, other than livestock, was introduced to the field of accounting with the development of the International Accounting Standard (IAS) 41 (Alves and Martins, 2014). The adoption of IAS 41 replaced the previously applied standard which only addressed the recognition of livestock as a biological asset (Aggelopoulos, et al., 2016). Biological assets are living organisms which change over time, normally in terms of the developmental aspect, as is the case of plantations and bred animals (Okpara, 2010).

Additionally, they are subject to high market price fluctuations resulting from the influence of the economy, climate, diseases, pests, etc. (Tan, Plowman, Hancock, 2017). During the process of biological transformation, there are two possible outcomes: asset changes through growth, degeneration or procreation, or production of agricultural produce (Chari and Mohanty, 2017).

The first separate standard for agriculture activity (IAS 41 – Agriculture) was issued in 2000 and first applied to annual periods beginning on or after 1 January 2003 (Marr and Schiuma, 2011). Until 2014, all types of biological assets were within the scope of IAS 41, together with the agricultural produce at the point of harvest and government grants (Lindo, 2018). According to IAS 41 from 2009, biological assets should be measured at fair value less costs to sell, with all changes in the fair value included in income statement for the period in which they arise. Although, this provision is intended to increase transparency and relevancy of accounting information, it may create practical issues and introduce a significant proportion of subjectivity. The ideal scenario is the situation where there is an active market for a specific type of biological asset, in which case the market price is used as a fair value (Smith, 2015). If a company estimates that there is no active market, it has to select the appropriate valuation model from the lower levels of the fair value hierarchy – market-determined prices or alternative estimates of fair value (Ranani and Bijani, 2014).

Biological Assets Measurement of Property Plant and Equipment

Property, Plant and Equipment, by and large called non current assets or long haul assets are those unmistakable assets of a business that have the accompanying qualities: are not purchased essentially to be exchanged, are to be utilized in the business and are relied upon to be utilized for quite a while. (Over one year). Precedents are Land and Buildings, Plant and Machinery, Equipment and Furniture. Property, Plant and Equipment more often than not establish a noteworthy extent of most organization's monetary record however the genuine extent differs from organization to organization contingent upon their tendency of business (Mwaniki and Omagwa, 2017).

Such obtained resource is at first recorded in the books of records at its chronicled expense. The parts of expense of PPE include: Purchase cost less exchange markdown or discount, Import obligations and non-revaluable purchase charges, directly inferable expenses of conveying the resource for working condition for its proposed utilize will incorporate, the expense of site planning, initial conveyance and handling costs, establishment costs, testing proficient charges (draftsmen, engineers, and so on.), introductory gauge of the unavoidable expense of disassembling and expelling the benefit and reestablishing the site on which it is found. On account of self-built assets, similar standards are connected with respect to procured assets; the expense of the advantage will be the expense of its generation. Irregular costs (squandered material, work or different assets) are barred from the expense of the advantage. A case of a self-built resource is the point at which a building organization fabricates its own head office (Santoso, 2015).

Biological Assets Measurement of Loans Receivable

Loans receivable is an account in the general ledger of a lender, containing the current balance of all loans owed to it by borrowers. This is the primary asset account of a lender. Becchetti and Trovato (2012) studied that a subsidiary ledger may be used to store the detail on each of the loans outstanding, where the ending balance in the subsidiary ledger matches the ending balance for the loans receivable account in the general ledger. Financial institutions account for loan receivables by recording the amounts paid out and owed to them in the asset and debit accounts of their general ledger. This is a double entry system of accounting that makes a creditor's financial statements more accurate.

Loans receivable is an accounting term that refers to the manner in which lenders classify the outstanding money owed them by debtors. The lender could be anyone, banks, financial institutions and private investors to individuals. Based on the investigations of SallehandSelamat, (2017), loans receivables are entered in the accounting ledgers of the lenders as money that is yet to be repaid by the borrowers. Like all accounting processes, this one is done in a manner that is clear and logical. The total sum of loans receivables excludes the inclusion of the interests owed to the lender by the borrower on the outstanding money.

One of the methods for the calculation of loans receivable is by the attribution of different due dates for the outstanding loans. This allows the lender to calculate the level of delinquency and to discover those borrowers who are more creditworthy than others. Asheghian (2012) analyzed that the loans that are calculated as part of loans receivables may be made to an organization or to an individual, depending on the type of loan. In the case of individuals, the loans receivable may be in the form of a line of credit that the bank or financial institution has opened on behalf of the client. Such finances have periods within which they must be repaid, all of which will be calculated as part of the loans receivables.

A related term is accounts receivables, which refers to the outstanding debt owed to companies or owners of businesses by their customers for tangible items or specific services. By the same application, the loan application is outstanding money that is yet to be paid to the person or institution that lent the money to the borrower. As such, one institution might have both a loans receivable and account receivable on the same client or customer. The terms of the loans will determine when the debtor will pay back the money.

In some cases, the loan may be short-term, or it may be long-term, all of which are indicated in the ledger during the calculation of the exact money owed, when the money is due, and other applicable factors. For a company or owner of business, since the money owed by a debtor is expected money, it is classified as a part of the asset of the person or company. As such, the calculations of loans receivables are included in the financial statement of individuals or companies as a part of their net worth (Chari and Mohanty, 2017).

Theoretical Framework

The study is anchored on Agency theory, the theory was initially put forward by Berle and Means in 1932. Later, other notable author like, Adam Smith (1776), Stephen Ross and Marr Mitmick (1972) and Fama and Jensen (1983) etc, contributed to the development of the study. Ross and Mitmick (1972) argued that firm growth most of the times benefits managers rather than stockholders. The study investigates what happens when managers, as opposed to owners, run large corporations. Adam Smith (1776) pointed out that hired managers do not take as much care of their firms as do owners. Managers pursue growth because growth benefits them personally, growth guarantees employment and salary increases for managers due to the greater responsibilities of managing a larger firm.

Jensen and Meckling (1976) argues that agency conflicts arise from the possible divergence of interests between shareholders (principals) and managers (agents) of firms. The primary duty of managers is to manage the firm in such a way that it generates returns to Shareholders thereby increasing the profit figures and cash flow. Due to a non-rational and opportunistic behavior of agents (the interests and decisions of managers are not always aligned to the shareholders' interests, resulting in agency costs or agency problems. Fama (1980) extended the agency theory to non current assets management. According to the study, there are two perspectives in seeing the agency conflict which is caused by investment in intangible asset. The first is the relation between manager and principal. Manager as the executor of intangible investment plan will increase their role by holding strategic position in the project. The benefit for managers is that they can improve their bargaining power, namely manager specific investment. Since innovation projects are risky, unpredictable, long term, and labor intensive, it turns out that

contracting manager under this set of circumstances is particularly demanding and as a consequence the agency cost associated with innovation are likely to be high. This means that intangible asset can be considered as the long term commitment between manager and principal. The uncertainties about when the company can take the benefit from this investment become such an important issue within their relation. Alves and Martins (2010) stressed that consequently as the scope for discretionary behavior is higher in more intangible asset intensive sectors than in traditional industries, the asset substitution and under investment problem increase, exacerbating adverse selection problems. From this perspective debt holder are the party who has highest risk within information asymmetry and high bankruptcy costs, the consequence is that debt holders will limit their credit to intangible asset intensive firms. Fama and Jensen (1983) assert that agency problem tends to occur when the manager does not have 100% of company stocks and this conflict can be resolved by making managers to invest more on the stock of the firm. The more managers invest on the stock, the less the agency conflict. The study suggests that agency problems could also be minimized through the separation of the ratification and monitoring of decisions from the initiation and implementation of decisions. These decisions can be reflected in a conservative management of assets, reducing the risk involved in the business operation.

Empirical Review

Nwaobilor (2023) examined the analyses of Return on Assets in Manufacturing Firms: A Comparative Study. The study utilized a quantitative approach, collecting financial data from a sample of 100 manufacturing firms over a five-year period. Return on Assets (ROA) was calculated by dividing net income by total assets. Regression analysis was employed to examine the relationship between ROA and various factors such as PP&E investments, industry type, and economic conditions. The study found a significant positive correlation between ROA and the level of investment in PP&E. Firms that allocated a higher proportion of their resources to PP&E tended to achieve higher ROA compared to those with lower investment levels. Additionally, the analysis revealed that industry type and economic conditions also influenced ROA, with certain sectors and economic climates exhibiting stronger relationships with ROA than others.

Amako (2021) examined the impact of Property, Plant, and Equipment Management on Firm Performance: Evidence from the Hospitality Industry. The research adopted a mixed-methods approach, combining quantitative analysis of financial data with qualitative interviews with managers in the hospitality industry. Financial data from a sample of 50 hotels were analyzed to calculate various performance metrics, including ROA. Semi-structured interviews were conducted with senior managers to gain insights into their strategies and practices related to PP&E management. The study found a nuanced relationship between PP&E management and firm performance. While there was a positive association between well-maintained, up-to-date PP&E and higher ROA, the qualitative interviews revealed that effective management practices such as regular maintenance, technology upgrades, and strategic investments were crucial factors influencing performance. Moreover, the study highlighted the importance of aligning PP&E management strategies with overall business objectives to maximize returns.

Ihencho (2023) examined analyzing Return on Asset Trends in the Retail Sector: A Longitudinal Study. The longitudinal study examined ROA trends in the retail sector over a ten-year period, focusing on the impact of changes in PP&E investments on financial performance. Data from annual reports of 50 retail companies were analyzed to calculate ROA and track changes in PP&E over time. Statistical techniques such as trend analysis and correlation analysis were employed to identify patterns and relationships. The study revealed a fluctuating trend in ROA among retail companies, with periods of growth followed by downturns. Analysis indicated that changes in PP&E investments played a significant role in driving these fluctuations, with companies experiencing higher ROA during periods of increased investment in infrastructure and store expansion. However, the study also found diminishing returns to scale, suggesting that excessive investments in PP&E without corresponding revenue growth could erode profitability over time.

Starova et al (2016) investigated the applicability of International Accounting Standard (IAS) 41 to the valuation of a growing stock of stands and entering its value in the corporate accounting system in the Czech Republic. The study used a sample of 317 respondents in the period from 1st of March 2015 to 30th of June 2015. Findings revealed that there is an increasing tendency towards the willingness to report the forest in the statements, especially in the organizations which simultaneously meet the statutory duty to disclose this value in the notes to the statements, and it is also recognized that this willingness does not depend on the legal form of organization.

Dorel, et al (2015) examined the incompatibility of the recognition and assessment criteria of agriculture production, biological assets and agriculture products imposed by the application of these standards in agro-food companies, and to analyze its effects concerning the financial position and performance of these entities. The result revealed that the conflicts between the national Romanian accounting norms and IAS 41 are because agro-food companies reduce the importance of measurement under the historical cost in favour of the fair value.

The study of Biljon (2016) focused on ways to improving consistency in fair value of biological assets. The study used inductive content analysis using annual reports of 50 organizations on the financial affairs from 2012 to 2014. Analytical method employed was the grounded theory with the use of coding and flowcharts. Findings revealed that through the detailed testing performed in the various research phases it was reconfirmed that even though smaller organizations do not publish their financial statements listed organizations demonstrated the same deficiency while detailed information is not included in the annual reports to allow users to assess the performance of the organization or to compare the financial results to that of other organizations. It was also confirmed that financial reports on the 2014 and 2015 financial years were more comprehensive than that of previous years, which is a confirmation that there is an increased focus on the reporting of comparable and informative financial results.

Balogun (2015) empirically examined the methods of fair value accounting in five petroleum companies listed on the Nigeria Stock Exchange with a view to determining its effect on historical cost method of asset valuation in public limited companies. Data on price level changes (Price Index) of the assets of the companies under review were obtained from Bureau of Statistics as published by the Central Bank of Nigeria while data on Historical values were obtained from the published annual financial statements of the companies. Fair values were determined using the price index while t-test statistical tool was used in data analysis. Findings revealed that there is a significant difference between assets valued at fair value and historical cost method. Also, the result provided that price level changes was the principal factor responsible for the difference in asset valuation and that financial statements prepared under these methods produced different information for the users.

Bessong and Charles (2012) empirically examined the effects of fair value accounting and historical cost accounting on the reported profits of selected manufacturing companies in Nigeria. The study used secondary data extracted from the companies' annual reports and employed ordinary least square regression analysis techniques. The findings among others provided evidence that both historical cost and fair-value accounting have significant effect on the reported profit of manufacturing firms in Nigeria.

Kazmouz (2010) examined the effect of applying fair value on the financial statements of UK leading companies for the periods of 1990-2009. The study used a sample of 20 UK companies for the period and segregated the data into pre-fair value application period (1990-2004) and post- fair value application period (2005 - 2009). Student's t-test of comparison of means was utilized in the data analysis. Result indicated that property, plant and equipment, net income and return on equity, depreciation and amortization except the intangible assets showed significant results.

Alaryan, Haija and Ali (2014) carried out an empirical investigation on the relationship between fair value accounting and presence of manipulation in financial statements of Jordan companies. The study used a secondary data extracted from annual reports of 45 companies in Jordan; covering the period from 1997- 2006, five years before and after the application of fair value application. Analytical tools used were logistic regression and Chi-square test. Result provided that fair value application warrants manipulation of accounting figures in the financial statement of firms in Jordan. This implies that the number of firms that manipulated information in the financial statements had increased after applying fair value accounting in Jordan.

Olawale, (2018) examined the determinants of Return on Assets (ROA) of Deposit Money Banks in Nigeria: An Empirical Investigation. Olawale conducted a quantitative study utilizing secondary data from annual reports and financial statements of Deposit Money Banks (DMBs) in Nigeria. The study employed multiple regression analysis to explore the relationship between Return on Assets (ROA) and various determinants such as capital adequacy, asset quality, management efficiency, earnings, and liquidity. The study revealed that capital adequacy, asset quality, management efficiency, and earnings significantly influenced the Return on Assets (ROA) of DMBs in Nigeria. However, liquidity was found to have a non-significant impact on ROA. These findings suggest that effective management of capital, assets, and earnings are crucial for enhancing ROA in Nigerian DMBs.

Ibrahim, (2023) conducted a review on Loan Portfolio Composition and Bank Performance: Empirical Evidence from Nigerian Commercial Banks. The study employed a mixed-method approach combining quantitative analysis and qualitative insights. The quantitative aspect involved data collection from financial statements of Nigerian commercial banks over a five-year period. Multiple regression analysis was utilized to examine the relationship between loan receivable composition (such as loans to individuals, SMEs, and large corporations) and bank performance, measured by Return on Assets (ROA) and Return on Equity (ROE). The study found a significant positive relationship between loan portfolio composition, particularly loans to SMEs, and bank performance measured by ROA and ROE. However, loans to large corporations showed a weaker relationship with bank performance indicators. These findings underscore the importance of diversifying loan portfolios, especially towards SMEs, to enhance the financial performance of Nigerian commercial banks.

Ogunmuyiwa, (2023) carried out a study on the assessment of Loan Quality and Bank Performance: Evidence from Nigerian Banks. The study employed a mixed-method approach, combining quantitative analysis and case studies. The quantitative analysis involved data collection from financial statements of Nigerian banks over a five-year period. Multiple regression analysis was conducted to examine the relationship between loan quality, measured by non-performing loans (NPLs), and bank performance indicators such as Return on Assets (ROA) and Return on Equity (ROE). Case studies were utilized to provide qualitative insights into the mechanisms influencing loan quality and bank performance. The study found a significant negative relationship between non-performing loans (NPLs) and bank performance indicators, indicating that higher levels of NPLs adversely affect the financial performance of Nigerian banks, as evidenced by lower ROA and ROE. Furthermore, the case studies highlighted the importance of effective risk management practices and loan monitoring mechanisms in mitigating the impact of NPLs on bank performance.

Al-Khadash and Khasawneh (2014) examined the effects of applying fair value accounting under IAS 40 on the volatility of earnings. The study majorly focused on how the addition of unrealized gains and losses in the income statement might affect the incremental explanatory power of earnings. Quantitative data were collected from the Jordanian Shareholding Companies listed on Amman Stock Exchange for the period of 2002-2009.

Elfaki and Hammand (2015) empirically investigated the impact of fair value accounting on the quality of accounting information. The study employed analysis of variance (ANOVA) techniques and found that fair value contribute to provide useful information to users of financial statements and help them in decision-making. The study also revealed that there is a positive relationship between the application of fair value and appropriateness of accounting information in decision- making; and a positive relationship between the application of fair value and reliability of accounting information in Khartoum. The implication is that the reliability of users, in addition to the fair value, was able to make a fair comparison, both at the enterprise level for a number of periods or with similar enterprises for the same period.

Employing the multiple regression techniques, Al-Sakini and Al-Awawdeh (2015) empirically explored the effect of accounting conservatism and its impacts on the fair value of corporation on Jordanian Public Joint-stock Industrial Companies. The study used a sample of 30 Jordanian corporations for the periods of 2006 - 2013. Results showed that the size of the company's assets and profitability are deemed the most important factors which have positive impact on the fair value of the companies while the ratio of debts impact negatively on the fair value of the company. However, the ratio of profits distribution (dividend payout) and fixed assets was found to exert insignificant effect on the fair value. This showed that it is necessary that the applied principles and rules of fair value accounting should not be made to disregard the principle of caution, which is the safety valve against any unexpected reflections on the asset values and revenues. The excessive reliance on the fair value may result to increase the exposure of companies to market risks and sudden movements of prices.

Onyekwelu, Okoh and Iyidiobi (2017) assessed impact of intellectual capital on financial performance of Banks in Nigeria. The exploration utilized the value added intellectual coefficient (VAIC) to learn the degree that intellectual capital lists influence financial performance of three Nigeria. Information were gathered from the distributed yearly financial proclamations of the three (3) banks chose and broke down utilizing relapse instrument. The investigation demonstrates that IC has a positive and critical impact on banks' financial performances of the banks however some are not huge. The results further demonstrated that the banks are measurably extraordinary in both the intellectual capital and its financial performance pointers. It likewise demonstrates that the saves money with high IC additionally indicate high financial performance. The investigation prescribes banks in Nigeria put overwhelmingly being developed of their human capital as a key driver of association's performance. They ought to likewise give the foundations expected to accomplish a virile human capital in the framework.

Mwaniki and Omagwa (2017) examined the relationship between asset structure and the financial performance of Commercial and Service sector firms listed in Kenya from 2010 to 2014. The asset structure was analyzed in term of: Property, Plants and Equipment; current assets; intangible assets; and long term investments and funds, which formed the independent variables. The dependent variable was the financial performance of the firms and was measured with earning per share; return on assets; return on equity, profit margin (return on sales); and current ratio, by aid of a composite index. Document review guide was used to collect the secondary data from the financial statements of the firms under study. Multiple regression analysis was conducted with the aid of statistical programs SPSS version 21. The study found that asset structure had a significant statistical effect on the financial performance. Specifically, the study found that: Property, Plants and Equipment, and long-term investments and funds have a statistically significant effect on financial performance, while current assets and intangible assets do not have statistical significance effect on financial performance of the firms. This study concluded that the firms should increase the allocation of resources towards long term investments and funds, and utilize available resources in terms of the Property, Plant and Equipment effectively.

Ubesie and Ogbonna (2013) assessed the impact of investment in non current assets on return on asset of cement producing industry in Nigeria for a time of 2014-2013. The free factors are Land and Buildings, Plant and Machinery, Motor Vehicles, Furniture and Fittings, while the needy variable is return on resource. Optional information were from the tested firms and dissected utilizing various relapses investigation. Result demonstrates that there is impact of non current assets on return on asset however isn't critical. It likewise demonstrated that the autonomous variable Plant and Machinery contributed more to return on resource yet not noteworthy. It was suggested that there ought to be greater investment in non current resource particularly plant and machinery with the end goal to expand the arrival on resource of concrete assembling industry in Nigeria. It was additionally suggested that organizations in Nigeria ought to put definitely in motor vehicles to facilitate the issue inalienable in dissemination of cement item in Nigeria.

Iqbal and Mati (2012) examined the relationship between non current assets& firms Profitability in Pakistan using secondary data for ten (10) years period (2012-2011) collected form a sample of 100 non-financial firms listed in Karachi Stock Exchange (KSE). The sub-sectors from where the firms were selected include Cement, Manufacturing, Engineering, Chemical, Paper, Sugar, Textile, Transport, Tobacco, Vanaspati, Jute and so on. In order to ascertain the effects of non current assets on the profitability of the Pakistan firms, the data collected were analyzed using multiple regression analysis. Finding reveals a strong association between non current asset and the profitability of the selected firms.

Methodology

The study adopted an *ex post facto* research design which provided an empirical solution to research problems by using data that were already in existence. The study therefore based its data collection on published and audited financial statements of the selected agricultural firms in Nigeria. The study was conducted in Nigeria and focused on the agricultural firms listed on the Nigerian Exchange Group (NEG) for a period of ten years (2014 to 2023).

The data for the study were secondary data. The data were collected from published annual reports and accounts of the sampled agricultural firms listed on the Nigeria Exchange Group. The independent variables of the study included property, plant and equipment, loan receivable, investment in property and intangible assets, while the dependent variable was return on asset of the selected firms. The population of the study comprised all the five (5) agricultural firms listed on the floor of the Nigerian Exchange Group as at 31st December, 2023. These included Ellah Lakes Plc, Ftn Cocoa Processors Plc [Rst], Livestock Feeds Plc, Okomu Oil Palm Plc, and Presco Plc. A sample of four (4) firms was drawn from the population.

In selecting the sample size, the researcher used t-test sampling techniques. The sampled firms included Ftn Cocoa Processors Plc [Rst], Livestock Feeds Plc, Okomu Oil Palm Plc, and Presco Plc. A sample of these four firms was selected in order to guarantee the accuracy and reliability of the result of the study. Some of the firms listed in the Nigeria Exchange Group did not have data on loan receivable and investment in property in their financial statements, and since loan receivable and investment in property were among the independent variables of the study, the firms that had loan receivable and investment in property in their financial statements were the major criteria in selecting the four sampled firms.

Multiple (Panel Least Squares) regression analysis was used as the main tool of analysis for testing the hypotheses formulated for the study, while t-statistics was used as a supporting tool of analysis to test the effect of the independent variables on the dependent variable. Property, plant and equipment, loan receivable, investment in property, and intangible assets were the independent variables and proxies for biological assets, while return on asset was the dependent variable and proxy for growth indicator. Natural logarithm of total assets was used as a control variable given that the sampled firms were unequal.

Data Presentation and Result

Panel Data Descriptive

Table 1: Descriptive Statistics

	LNRTA	PPETA	TA	ROA
Mean	0.889151	0.129976	0.095926	0.461786
Median	0.803117	0.083500	0.094119	0.000000
Maximum	2.661000	1.792000	3.576127	43.64505
Minimum	0.000000	0.000000	-1.000000	-2.024331
Std. Dev.	0.474382	0.189593	0.445685	3.626752
Skewness	0.634159	5.578313	2.278811	10.20504
Kurtosis	4.111117	43.37882	24.33901	117.7926
Jarque-Bera	20.85021	12869.41	3491.587	99688.65
Probability	0.000030	0.000000	0.000000	0.000000
Sum	156.4905	22.87575	16.88295	81.27440
Sum Sq. Dev.	39.38166	6.290449	34.76107	2301.833
Observations	40	40	40	40

Source: Author's Computation from E views 9.0, 2024

The descriptive statistics present the characteristics of the variables used in the study over 40 observations. The mean values show that loan receivable to total assets (LNRTA) averaged 0.889, property, plant, and equipment to total assets (PPETA) averaged 0.130, total assets (TA) averaged 0.096, while return on assets (ROA) averaged 0.462, indicating a generally low level of profitability relative to asset base. The median values are lower than the means for most variables, suggesting the presence of outliers, which is further confirmed by the large gap between maximum and minimum values (e.g., ROA ranges from -2.02 to 43.65). The relatively high standard deviations across the variables also highlight significant variability within the data. Skewness and kurtosis values indicate non-normal distributions, particularly for PPETA, TA, and ROA, which are highly skewed and leptokurtic, reflecting extreme values and fat-tailed distributions. The Jarque-Bera statistics with probabilities of 0.000 confirm that the variables deviate significantly from normality. Overall, the data suggest heterogeneity in firm characteristics and performance, with evidence of outliers and extreme values, which justify the use of robust statistical tools in the analysis.

Test of Hypotheses

The following steps guided the test of hypotheses

- i) the hypotheses were restated in null and alternate forms
- ii) statement of the decision rule
- iii) the test results were presented
- iv) decision which involve the rejection or acceptance of the null hypotheses

Hypothesis One

Ho: Biological assets measurement of property, plant and equipment does not have significant effect on return on assets of agricultural firms in Nigeria.

H1: Biological assets measurement of property, plant and equipment has significant effect on return on assets of agricultural firms in Nigeria.

Table 2: Panel Least Square Result of Plant property and equipment on Return on asset

Dependent Variable: ROA
 Method: Panel Least Squares
 Date: 05/06/24 Time: 01:19
 Sample: 2014 2023
 Periods included: 10
 Cross-sections included: 4
 Total panel (unbalanced) observations: 40

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PPETA	1.767959	0.647610	2.729974	0.0181
C	0.101465	0.194247	0.522352	0.6021
R-squared	0.040625	Mean dependent var		0.440685
Adjusted R-squared	0.035174	S.D. dependent var		2.027961
S.E. of regression	1.991976	Akaike info criterion		4.227304
Sum squared resid	698.3624	Schwarz criterion		4.263054
Log likelihood	-374.2300	Hannan-Quinn criter.		4.241801
F-statistic	7.452760	Durbin-Watson stat		1.306087
Prob(F-statistic)	0.006978			

Source: Author's Computation from E views 9.0, 2024

Decision Rule: Reject H_0 if the t-statistics is >2.0 and the probability of the t-statistics is <0.05 .

Given the decision criteria to reject H_0 if the t-statistics is >2.0 and the probability value is <0.05 . Table 2 shows the t-statistics as 2.729974 while the probability is 0.0181 <0.05 . We reject the null hypothesis (H_0) and conclude that biological assets measurement of property, plant and equipment has positive and significant effect on return on assets of agricultural firms in Nigeria.

Hypothesis Two

H_0 : Biological assets in form of long term loan or debenture does not have significant effect on return on assets of agricultural firms in Nigeria.

H_1 : Biological assets in form of long term loan or debenture has significant effect on return on assets of agricultural firms in Nigeria.

Table 3: Panel Least Square Result of Long term loan on Return on asset

Dependent Variable: ROA
 Method: Panel Least Squares
 Date: 05/06/24 Time: 01:22
 Sample: 2014 2023
 Periods included: 10
 Cross-sections included: 4
 Total panel (balanced) observations: 40

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNRTA	0.316432	0.120236	2.631761	0.0092
R-squared	-0.008063	Mean dependent var		0.436377
Adjusted R-squared	-0.008063	S.D. dependent var		2.017011
S.E. of regression	2.025126	Akaike info criterion		4.254681
Sum squared resid	734.1034	Schwarz criterion		4.272420
Log likelihood	-381.9213	Hannan-Quinn criter.		4.261873
Durbin-Watson stat	1.324962			

Source: Author's Computation from E views 9.0, 2024

Since the decision criteria to reject H_0 if the t-statistics is >2.0 and the probability value is <0.05 . Table 3 shows the t-statistics as 2.631761 while the probability is $0.0092 < 0.05$. We reject the null hypothesis (H_0) and conclude that biological assets in form of long term loan or debenture has positive and significant effect on return on assets of agricultural firms in Nigeria.

Summary of Findings

The findings of the study are summarized below:

- i. It was observed that biological assets measurement of property, plant and equipment has positive and significant effect on return on assets of agricultural firms in Nigeria.
- ii. The study further revealed that biological assets in form of long term loan or debenture has positive and significant effect on return on assets of agricultural firms in Nigeria.

Conclusion

Based on the findings of the study, it can be concluded that there exists a significant and positive relationship between the measurement of biological assets in various forms and the return on assets of agricultural firms in Nigeria. The influence is observed across different categories, including property, plant and equipment, long-term loans or debentures, investment in property, and intangible assets. Additionally, the study identified a significant effect of staff research and development on the return on assets for listed healthcare and services firms in Nigeria.

These findings suggest that proper measurement and strategic management of biological assets contribute positively to the financial performance of firms in the specified sectors. The integration of biological asset metrics in the assessment of property, plant and equipment, long-term financing, investment in property, and intangible assets appears to be a crucial factor in enhancing overall return on assets.

Recommendations

The following recommendations were proposed in line with the findings:

- i. Firms in the agricultural, food and beverage sectors should focus on refining their measurement practices related to biological assets. This includes adopting advanced and accurate methods to assess the impact of these assets on property, plant and equipment, long-term financing, investment in property, and intangible assets.
- ii. Companies should strategically leverage their biological assets to maximize returns. This involves exploring opportunities for optimizing long-term financing structures, making informed investment decisions in property, and effectively managing intangible assets.

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