Moderating Role of Managerial Ownership on Nexus between Inventory Days and Working Capital to Asset Ratio on Firm Performance: Evidence from Listed Industrial and Consumer Goods Companies in Nigeria

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Abstract. The management of working capital is a crucial area of business management that can make or mar the existence of a business entity. This must be matched against the available assets of the organization. Since working capital determines how the operations of a company is run daily, it requires absolute attention and the area of interest is the management of inventory. Businesses will strive to make goods available to meet customers demand while also taking caution not to over-stock to mitigate possible pilfering, deterioration, unnecessary trapping of finance in inventories, etc. In order to maintain a healthy cash level for the business, managers would typically take proactive steps to ensure a shorter time lag between investments in inventories and when they are converted back to cash. This study looked at how this possibility would affect a company's performance. The study takes a novel turn by taking into account the moderating impact of managers who have equity stakes in the company in order to mitigate inadequate inventory management in listed industrial and consumer goods companies in Nigeria. The study's methodology is based on agency theory, and the data for the 2012–2021 study period was taken from the annual reports of 26 listed industrial and consumer goods companies in Nigeria. The use of an ex post facto research design was justified by the nature of the data. Using a multivariate regression model, the study's relationship between its variables was examined. The findings demonstrated that managerial ownership significantly modifies the impact of the working capital to total asset ratio on financial performance. Based on the findings of the analysis, it was advised that the management of listed consumer and industrial goods companies in Nigeria increase the effectiveness and efficiency of working capital management to improve company performance as well as that they adhere to stock management models that enhance corporate performance.

Keywords: inventory days ratio, working capital to assets ratio, managerial ownership, return on assets, firm size

Introduction

The management of inventory is one of the priority areas for organizations. It is a very crucial asset to companies especially in the manufacturing industry. A breakdown of the current assets' component on the statement of financial position of a company will usually show inventories having a significant portion comprising of unprocessed materials, materials in process and finished products (Carter, 2006). Hence, maximum strategic attention has to be accorded inventory management because of its role in production and profitability (Kolias *et al.*, 2011). These scholars opined that the performance of a company can be highly affected in the absence of proper management of inventories which may result in the long run to business failure. Management must ensure to put up such a system of inventory management to forestall the possible calamity that may result from inefficient inventory management. Poor inventory management can create liquidity challenges to a company. In essence, efficient inventory management encourages prompt conversion because quick conversion of inventories to cash and its equivalent will cushion any occurrence of liquidity problems the company may be faced with (Emmanuel *et al.*, 2022).

In corporate finance, raising finance for operational activities can be complicated when a company is faced with liquidity problems. In Kim *et al*. (1998), it was argued that firms facing liquidity constraints are likely to have problems of raising external funds. Managers with growth in mind will strive to build a vast and robust understanding of the cost of raising capital relative to the available assets in the company. Working capital assets within the organization should normally be first option to consider in business financing because it is cheaper but results from effectiveness of management. Alrjoub and Ahmad (2017) averred that if management decides to finance the company from external sources rather than manage the available liquid assets, the result will be higher interest rate which may adversely affect the performance level of the company. Experienced business managers would always take the option of an internal financing before contemplating any other form because of the need to eliminate possible costs. Such behaviour aligns with the dictate of the pecking order theory propounded in 1984 by Myers and Majluf. According to Emmanuel (2012), most firms prefer financing their businesses with short-term finance which has lower interest rate and more profitability to firms than the use of both medium-term and long-term funds.

Proper inventory management concerns the comparison of the cost of holding organizational inventories against the benefits of holding such inventories. Emmanuel (2022) therefore affirmed that inventory management is best described as a trade-off between the costs of keeping inventories as against the benefits of holding the inventories and how it affects organization performance. The effect of inventory management on business performance has attracted the interest of researchers in the field of management over the years because of the relevance of inventory to business success. Although, there have been differing results from previous research with respect to how inventory affects performance which is not unconnected with factors such as financial system stability, high financing cost associated with raising fund in developing countries etc. Still, inventory management is a core area in operation management being taken seriously in business management.

One important aspect of working capital management borders on how the organization is structured and handled. The level of equity interest belonging to the managers may influence their attitude towards effectively managing inventory and deciding the form of financing method to adopt managerial ownership, according to Yarram (2013), is the proportion of shares that a firm's management owns either naturally or through participation on the board of directors, through the performance of managerial duties, or via mixture of the two. Where the managers have interest to protect, they will most likely make inform decisions that will give them benefits. Olanisebe (2019) averred that having a managerial form of ownership structure can be a ready-made resolution to agency problems which can enhance policies regarding working capital management. Scholars' opinions on how managerial ownership affects working capital management vary. According to Lee and Lee (2009), managerial ownership and inventory day have a beneficial association. Butt (2009) also made the case that when management acquires an ownership part in the company, their increased managerial self-interest in the long-term viability of the business may motivate them to improve working capital management practices. Yet, according to Abdioglu (2016), there might be some elements that obstruct the usual flow, leading to a negative association between managerial ownership and working capital management.

Inventories requirement of organizations need to be properly financed to improve performance (Alrjoub & Ahmad, 2017). The responsibility therefore is on managers to advice management on the cost and benefit of investing assets to secure inventories and ensuring timely conversion of same to liquid to sustain the cycle. This study focuses on the role of managerial ownership in moderating the relationship between Inventory Day, working capital to asset ratio and financial performance of listed Industrial and Consumers Goods companies in Nigeria. Given the above, we thus hypothesized that:

$H0_1$: Inventory Days Ratio has no significant effect on return on assets when it is moderated by managerial ownership in listed industrial and consumer goods companies in Nigeria.

$H0_2$: Working Capital to Asset Ratio have no significant effect on return on assets when it is moderated by managerial ownership in listed industrial and consumer goods companies in Nigeria.

Literature Review

Conceptual Framework

Managerial Ownership

The relationship between ownership structure and firm performance in emerging markets has been a topical issue among scholars with inconsistent evidence. Some have argued that managerial ownership is a panacea for improved firm performance even with minimal supervision of managers. This was substantiated by the assertion of Butt (2009) that when managers obtain equity stake in an organization, higher self interest in the long-term sustainability of the organization is induced resulting in increased working capital policies that will translate to effective working capital management. In fact, with managerial ownership structure in place, efficient market creates discipline for managers.

As an internal governance mechanism, managerial ownership can be deployed as a matter of strategy to control and influence management to protect owners' interests with dispersed ownership, which is frequent with tiny shareholders, owners have little or no control on managerial activities because they face all the expenses of supervising with a modest amount of rewards. Gillan (2006) argued that a dispersed ownership system, whose principals are often reluctant and incapable of regulate management, lacking both the resources and the desire to handle managerial agency concerns because market controls are the main governing mechanisms. Managerial ownership can fix this anomaly because management have interests in the firm and don't need intensive oversight to achieve exceptional because they're also engaged in wealth maximization (Pankaj, 2016).

Managerial ownership is not a common practice in emerging and developing countries. However, the adoption of managerial ownership structure can become a tool to eliminate possible conflicts of interest between managers and business owners since shareholders will not need to bother much about effectively monitoring of managers (Bhaumik & Selarka, 2012). Although, there may be another dimension of conflict between the controlling shareholders and the managerial shareholding as managers with their stakes in the organization may act in their own interests (Gaur *et al.*, 2015). Bhojraj and Sengupta (2003) asserted that major shareholders in companies try to get involved in and steer firm management, which results in reduced information access for other shareholders. This according to the study is achieved through the exercise of undue influence over management to secure benefits that are inimical to minority shareholders. The focus of this study is to examine the moderating role of managerial ownership on the effect of inventory days and working capital to asset ratio on firm performance.

Inventory Days

Inventory days, also known as days inventory outstanding (DIO), is a financial term that quantifies the average number of days it takes a company to sell its inventory. Inventory days can also be abbreviated as "inventory days." It is an element of working capital management, that manages a company's short-term assets and liabilities to guarantee the smooth functioning of the firm. This portion of working capital management is working capital forecasting (Ross *et al.*, 2008).

The number of inventory days can be determined by first calculating the value of a company's inventory in relation to its cost of goods sold, followed by multiplying this result by the total number of days in the period under consideration. The value that was arrived at shows the typical number of working days required by the organization to convert its available inventory into revenue (Gitman, 2009; Afrifa, 2016; Mshelia 2016).

The number of days an inventory is kept on hand is a crucial indicator for businesses to track, since it can have a substantial bearing on the firms' overall financial performance. High inventory days may be an indication that a firm is storing an excessive amount of inventory, which may prevent the company from releasing precious cash and lead to increased costs associated with storage and handling. On the other hand, low inventory days may be an indication that a company does not retain sufficient inventory, which may lead to decreased customer satisfaction and lost sales (Lazaridis & Dimitrios, 2005).

The possible effect of the rate of ownership of a company's managers on the relationship between working capital management and firm performance is referred to as the moderating role of managerial ownership on the relationship between working capital management and firm performance. This role refers to the potential impact that this level of ownership can have on the relationship. It appears from this that the level of ownership that managers have in a company can have an effect on how that firm manages its working capital, which in turn can have an effect on the company's overall success.

Inventory Days Ratio

Inventory Days Ratio, also known as Days Inventory Outstanding (DIO), is a financial ratio that evaluates the number of days it requires for a company to convert its inventory into sales. Another name for this ratio is Days Inventory Outstanding Ratio (DIO). To determine it, first divide the average inventory by the cost of goods sold (COGS), and then multiply the resulting number by the number of days included in the period being measured. The following is the formula for calculating the Inventory Days Ratio:

$$\text{Inventory Days Ratio} = (\text{Average Inventory} / \text{COGS}) \times \text{Number of days}$$

The ratio is a measure of how efficiently a company is managing its inventory, and a lower ratio indicates that a company can sell its inventory quickly and efficiently, while a higher ratio suggests that inventory is taking longer to sell, which can lead to excess inventory, obsolescence, and storage costs.

The Inventory Days Ratio can also be used to compare a company's performance over time or to benchmark it against other companies in the same industry. It is important to note that the appropriate range for the ratio can vary significantly by industry and company, so it is essential to consider the company's business model and industry norms when interpreting the ratio.

Working Capital to Asset

In addition to ensuring that the firm has enough cash to meet its expenses and debt, the goals of working capital management include reducing the cost of the money spent on working capital and increasing the return on asset investments. Monitoring cash flow, current assets, and current liabilities through ratio analysis of the important components of working capital, such as the working capital ratio, collection ratio, and inventory turnover ratio, is a common component of this practice. According to Maverick (2022), the fact that a company is not profitable is not the reason that it goes out of business; rather, it is the quick depletion of cash reserves that leads to a company's inability to make its ongoing payment obligations that is the cause of business failure. It is essential to keep in mind that even financially successful businesses run the risk of exhausting their cash reserves if they pursue expansion strategies that involve making new investments that call for funding. So, managers are required to weigh their

options so that they can avoid potential problems. The disparity between a company's current assets and current liabilities is the primary component of its working capital. When it is necessary to make a direct comparison in percentage terms between current assets and current liabilities, the working capital ratio is utilized. It contributes to the process of determining how healthy a company's finances are.

If a business needs to fulfill its financial commitments, maintaining adequate liquidity is essential. Regardless of how promising the prospects for the company's future growth may appear, the fact that the reverse is the case is a warning sign that the company is in jeopardy of going bankrupt. There is a school of thought that contends the working capital ratio does not paint an accurate picture of the liquidity position of a company. Empirical evidence, on the other hand, has shown that the ratio of working capital reflects the net result of completely liquidating all assets in order to satisfy liabilities, which is an event that happens very infrequently in the real world of business. It does not take into account any additional sources of accessible financing that the company might have, such as any existing lines of credit that are not being used. Companies, as a matter of practice, do not access credit lines for more cash on hand than is absolutely necessary because doing so would incur interest costs that are not necessary. But, doing business on such a basis may give the impression that the ratio of working capital is unreasonably low. Nevertheless, comparisons of working capital levels over time can at least serve as potential early warning indicators that a company may have problems in terms of the timely collection of receivables that, if not addressed, could lead to a future liquidity crisis. These problems, if left unaddressed, could cause the company to be in a precarious financial situation.

Organizational efficiency and short-term financial health are determined by the working capital to asset ratio. It determines liquidity and operational effectiveness by measuring net working capital. A high working capital to asset ratio shows that management is strategically protecting the company's assets from short-term obligations. A corporation with a working capital ratio below one has negative cash flow and fewer assets than liabilities. With present working capital, the corporation cannot pay its debts. Hence, the corporation may struggle to pay creditors. Management must quickly implement a policy to address low working capital because it could lead to financial disaster. Thus, they must address the possible causes of the working capital decline, such as a sharp drop in sales revenues, poor inventory management, or poor credit policy. Yet, high working capital may imply that the organization is letting surplus cash flow lie idle rather than investing it in expansion. Like other performance indicators, a company's ratio should be compared to similar companies in its industry (Maverick, 2022).

Working Capital to Asset Ratio

The ratio of a company's working capital to its total assets is a type of financial ratio that determines the proportion of a business's total assets that are funded by the working capital of that business. The disparity between a company's current assets and current liabilities is the primary component of its working capital. The ratio of working capital to assets can be calculated using the following formula:

Working Capital to Asset Ratio = (Current Assets - Current Liabilities) / Total Assets

The ability of a corporation to meet its short-term obligations using the assets it now possesses is represented by this ratio. A smaller ratio signifies that a company relies less on its working capital to fund its assets, while a higher ratio indicates that a greater proportion of a company's assets are supported by the company's working capital. Investors and creditors frequently turn to the working capital to asset ratio when attempting to evaluate the short-term liquidity of a firm as well as the company's overall financial health.

Firm Performance

A company's performance can be defined as the degree to which it is succeeding in meeting the objectives and goals it has set for its business. Typically, it is evaluated using both financial and non-financial measures including as revenue, earnings, return on investment, market share, customer happiness, employee engagement, innovation, and sustainability. These are just a few examples (Meiryani *et al.,* 2020).

Financial performance measures include indicators such as revenue growth, profitability (e.g., net income margin, return on equity, return on assets), cash flow, and stock price. Non-financial performance indicators include customer satisfaction, employee productivity, market share, innovation, and environmental and social impact (Alawad *et al*., 2015).

A company's performance is critical to its long-term success and survival. A company that performs well is likely to attract more investment, retain and attract talented employees, and maintain a competitive advantage over its peers. Therefore, measuring and improving firm performance is an essential task for business leaders, shareholders, and other stakeholders. In this study return on assets is the proxy for firm performance.

Return on Assets

The evaluation of company's performance can be assisted using some evaluation tools. One of such measurement tools is the profitability ratio. Profitability ratio establishes the ability of a company to manage its assets efficiently. In essence, profitability of a company can be assessed through measuring the returns made from the use of its assets. The effectiveness in using assets to generate returns is what return on assets attempts to measure (Aghekyan *et al.*, 2012). The ability of the company to make efficient and effective use of its assets has the potential to result in the generation of net profit, which is the return on the money that was invested in the asset. According to Alawad *et al.* (2015), calculating a company's return on assets is a method of accounting for the efficacy with which a company manages its assets in order to achieve a reasonable outcome. The return on asset measurement applies several factors employed by investors in the market in determining the value of a company while also avoiding direct comparisons with the market value (Meiryani *et al.*, 2020). Petcharit *et al*. (2020) opined that return on assets are provides an assessment of a company's ability to generate earnings from efficient use of assets in the past and then project the future profit possibility. Stakeholders in business are most concerned about the performance of the business since it determines their current and future value.

Firm Size

The size of the corporation is one of the variables affecting performance. A measure known as "firm size" displays a company's boundaries. The majority of the time, total assets and total sales are used to determine the firm size. Companies with big total assets are thought to have good prospects in a time of relative stability and can turn a profit as opposed to enterprises with modest total assets, according to Chen et al. Because of the idea of economies of scale, businesses can use their size to control the inputs they use, lowering their average costs and boosting their profitability. This suggests that businesses may produce items for a lot less money. Due to their larger markets and greater possibility to make significant profits, large scale businesses are more competitive than small businesses (Damarwan & Toro, 2012). The number of employees at companies with high market capitalization increases, which is another indicator of the size of the business. The public can receive a positive message about a company's future prospects based on its size.

Empirical Review

The mediating function of cost of capital in the link between inventory management and company performance was evaluated by Emmanuel et al. in 2022. 40 manufacturing companies that were listed on the Nigerian stock exchange market from 2010 to 2020 made up the study's

population. Only 33 out of the 40 firms were included for the study with 363 observations because 7 companies did not complete their data. The Machame Ratio database created by Talk Data Associates served as the primary source for the secondary data. Panel ordinary least squares regression and a structural equation model were both employed to analyze the data for this investigation. The study's conclusions showed that inventory management, as measured by inventory turnover ratio and inventory conversion period, has little bearing on the performance of manufacturing enterprises in Nigeria. The study came to the conclusion that, despite the significant and favorable influence of cost of capital on firms' performance, there is no moderating relationship between cost of capital and the performance of manufacturing enterprises in Nigeria. So, it was suggested that the government should forbid the importation of commodities that might be made locally instead. Managers should also look for lower cost of capital and be careful not to use loans intended for inventories for other reasons. Furthermore, the review could have provided more information on the limitations of the study, such as the fact that only a subset of the total population was used due to incomplete data. This would have helped readers to understand the potential implications of these limitations for the generalizability of the study's findings. Lastly, the recommendations provided in the review could have been more specific and actionable. For instance, the review recommends that managers should source for cheaper cost of capital, but it does not provide specific strategies or tactics that managers could use to achieve this goal.

Randa (2022) centered his research on the short-term investment and financing decisions that are impacted by a company's working capital policy, as well as the impact that working capital policies have on the financial performance of manufacturing companies in Malaysia. The study examined working capital investment policy based on the ratio of current assets to total assets. A proxy for working capital policies was working capital financing and investment policies. The study took into account the matching working capital financing strategy, which was something that had not been taken into account in earlier empirical investigations. Over the years 2010 through 2019, information was gathered on 147 companies, covering a total of 1470 firm-year observations. According to the findings, having a high ratio of current assets to total assets had a significant and detrimental impact on the financial performance of businesses. In the meantime, it was found that a firm's financial performance was positively and significantly associated to a policy of working capital financing that was conservative. It was determined that manufacturing companies could improve their operational income by adopting a more aggressive policy regarding their investments in working capital. As a result, it was recommended that manufacturing companies should increase their operating income by implementing a conservative working capital financing policy rather than a matching or aggressive working capital financing policy. This was done so as to avoid the potential risks associated with the latter two policies. However, it would have been helpful to have more details about the limitations of the study, such as any potential biases or issues with the data sources. Additionally, a brief discussion of the implications of the findings for future research or for practitioners in the field would have been useful.

The association between Days Inventory Outstanding (DIO) and business performance in the energy industry in Saudi Arabia was investigated by Khaled and Omar (2020), and their research covered a span of seven years and included samples from 21 different companies. Based on the results of the pooled OLS Regression, it appears that DIO has a negative association with company performance. According to the findings of the study, businesses are likely to realize major advancements in their inventory management after putting into practice a variety of different methods. According to the findings of the study, proper planning and forecasting strategies for inventory, the development of innovative marketing strategies, improvements to pricing strategies, the establishment of the best product mix, and simultaneous targeting of the products that are selling the best were all things that should be done. The review

does not go into detail about the theoretical or conceptual framework that was employed in the study, despite the fact that it offers a clear and succinct summary of the study. In addition, the evaluation does not include any information regarding the limits of the study, such as potential biases or concerns with the data sources or the analytical methods that were utilized. Furthermore, the recommendations provided by the review are general and not specific to the energy industry in Saudi Arabia. It would have been useful to have recommendations tailored to the context of the energy industry in Saudi Arabia, such as specific challenges or opportunities that firms in this industry face.

Ugwu *et al.* (2020) researched the effect that inventory management has on the performance of firms in Nigeria by using the opinions of the general public. The survey design utilized was a grass-roots opinion (primary questionnaire) survey, and it concentrated its attention on a purposefully sampled group of ten businesses that had a total staff strength of 710 individuals. The method of analysis applied was descriptive statistics. Result showed that the exploratory variables have positive significant impact on firm performance in Nigeria. The recommendation for this study was that manufacturing firms in Nigeria should adhere to stock management models that impact corporate performance. While the recommendation is relevant to the findings of the study, it lacks specific details on what types of stock management models would be most effective for manufacturing firms in Nigeria. Moreover, the literature review lacks some important details such as the specific measures of inventory management and firm performance used in the study, the theoretical or conceptual framework guiding the study, and potential limitations of the study. Additionally, the use of a grassroots opinion survey design may limit the generalizability of the study's findings.

Bambang *et al.* (2017) conducted research to study the effects of working capital regulation on the performance of firms and the value of firms. From 2010 to 2013, manufacturing companies that were traded on the Indonesia Stock Exchange were responsible for conducting the research. The ratios of a company's current assets to its total assets and its current liabilities to its total assets are the variables that serve as proxies for the working capital policy. As a control variable, we decided to go with leverage as a proxy for capital structure. The worth of the company is determined by Tobin's Q, and the variables that are used as proxies for the performance of the company include return on assets. Purposive sampling is utilized throughout the various data collection methods. The findings demonstrated that the ratio of current assets to total assets has a beneficial and significant impact on the operation of the company. Both the ratio of current liabilities to total assets and leverage have a significant and detrimental impact on the success of the company. The study came to the conclusion that the performance of the company is impacted by the policy of working capital management in terms of determining the amount of working capital. This can be done either through the management of current assets or through the determination of short-term funding sources. As a result of this finding, the research concluded that managers should make it a priority to improve the efficacy and efficiency of the management of working capital in order to boost the performance of their companies. A condensed summary of the most important findings and recommendations from the research may be found in the literature review. On the other hand, it would be helpful if more precise information on the procedures employed in the study were included, such as the particular statistical methods that were utilized to analyze the data. In addition, the literature review could benefit from a more in-depth discussion of the potential implications of the study's findings for managers and policymakers in Indonesia, if such a discussion were to be included.

Theoretical Framework

Fisher Separation Theorem

Fisher separation theorem explains a situation where owners and managers of firms are perfectly rational and will only pursue a single criterion for profit maximization. This criterion is for them to put their funds in investment with net present value. Hochstein (2001) asserts that the Fisher separation theorem suggests that the decision to invest is completely driven by the goal of maximizing wealth, without consideration for the individual's subjective preferences, which factor into the decision to consume. As a result, the choice to invest can be made independently of personal usefulness. By defining words like gross working capital and net working capital, Rehn (2012) distinguished between investing in working capital and financing it. He claims that because it takes into account investments in accounts receivable, cash, accounts payable, inventory, and financial intervention, this theory is compatible with any variable. This indicates that businesses should not confuse financing an investment with making an investment (Mshelia, 2016).

Managers of businesses are often faced with investment decisions. In this case having to invest in short term assets. Such decisions should be pursued with the aim of creating shareholder's wealth. To achieve this, the strategy to ensure that demand is on the increase with a suitable pricing system to encourage buying at a profit to the company must also be instituted by the managers. The concept of this theory suggests that managers though individualistic in the pursuit of their own personal gain, should keep aside individual utility while pursuing the corporate goal that will improve firm performance.

The Economic Order Quantity (EOQ) Model

Warehouse management system is an important aspect of an organization decision making area which affects working capital management (Samithamby, 2020). The system concerns itself with ensuring that inventories are properly managed, overhead cost controlled, pricing meets market reality etc. One of the key decision areas however is how to determine and maintain an optimal ordering quantity of inventory without unnecessary costs. Economic Order Quantity (EOQ) reflects the quantity of store item a company should keep reducing the handling cost and ordering cost. The essence is to control incremental cost from rising beyond the cost of procuring material (Rakesh, 2019). According to Samithamby (2020), the model is a valuable tool in working capital management to determine how much inventory to keep on hand, quantity of item to order per time and how often orders should be placed to incur lowest cost possible.

Ford W. Harris created the Economic Order Quantity model in 1913 to help businesses find the optimal order size. According to Mensah (2011), the EOQ model is a straightforward idea for calculating the optimum stock and purchase size for a business. Organizations can reduce their ordering and storage costs by adopting this technique. The expenses incurred by a business when buying more inventories are known as "ordering costs," and they include things like the price of making contact with suppliers, the cost of printing and stationery, the salary of the purchasing department, the price of inspecting and receiving the material, and the price of transporting the finished product (Rakesh, 2019). The expenses incurred when stock is physically stored in a warehouse or retail establishment constitute the carrying cost. Expenses like this include the price of warehousing, the price of spoilage and obsolescence, insurance, theft, and other costs.

The Economic Order Quantity (EOQ) theory is crucial to this investigation because of its potential to improve a company's liquidity. According to research by Kamau and Kagiri (2015), having a lot of stock on hand gives a company more leeway to adapt to changing market conditions. The idea aids decision makers in weighing the pros and cons of stockpiling goods

and settling on the optimum level of inventory. To fully grasp the cash management model and the fundamental challenge of working capital management, it is helpful to first grasp the EOQ model.

Agency Theory

According to agency theory, the degree of ownership that managers have in the company can have an impact on the relationship between the principal (i.e., shareholders) and the agent (i.e., managers). When managers own a sizable portion of the company, their interests are thought to be more closely aligned with those of the shareholders, making them more likely to act in the company's best interests. The hypothesis contends that when managerial ownership levels are high, managers are more likely to take a proactive approach to managing the firm's working capital, which can result in higher performance. This is because managers are more driven to make choices that will improve the performance of the company because they have a higher stake in its success. Conversely, when managerial ownership is limited, managers might not be as driven to effectively manage the company's working capital because they do not have a sizable personal stake in the business' performance.

Agency issues between managers and shareholders can have an impact on company investment and finance decisions, according to Fazzar *et al.* (1988). They contend that managers are more inclined to behave in the best interests of the shareholders when they have a big investment in the company, which can enhance the success of the business (Fazzar *et al.*, 1988). The idea of property rights, the form of the firm, and how it may affect managers' conduct was introduced by Hart and Moore in 1990. They contend that managerial ownership levels can be crucial in bringing managers' and shareholders' interests into alignment, which can boost business performance (Hart & Moore, 1990). Denis and McConnell looked into the connection between corporate governance and business performance in 2003. They contend that management ownership can be a critical tool for addressing issues of agency between managers and shareholders and that higher degrees of managerial ownership are linked to better business outcomes (Denis & McConnell, 2003). Therefore, agency theory proposes that the level of managerial ownership can modify the relationship between working capital management and firm performance, with the result that the positive relationship between these variables is higher when managerial ownership is high.

Methodology

This study uses an ex-post facto research design and a correlational review. Exploratory research is used to make more accurate evaluations of hypotheses from an operational point of view. This study will use a qualitative research design, even though it is based on consolidated theories of corporate finance. For this study, this design was chosen because it lets the researcher focus on specific theories and use case studies to come to empirical conclusions. The goal of this non-experimental design is to find out how ownership structure affects the relationship between working capital management and firm performance in Industrial and Consumer Goods companies in Nigeria. Given this design, the data is very historical and always changing. Because of this, the framework of this design collected data, measured the data, and did an empirical analysis that led to a positive, negative, or no correlation. No matter how it turns out, it must add to what we know. The information used in the study came from the financial statements (statement of financial position and comprehensive income statement) of the sampled companies. These statements can be gotten from the companies themselves or from the Nigeria Exchange Group. The goal of the study was to find out how working capital management affects the performance of a firm, taking into account the moderating role of managerial ownership. The data will help figure out if and how much there is a connection between two or more measurable variables. The panel data were analyzed using a method

called multivariate correlation. A correlation coefficient will show how close the two things are. Return on assets stands in for the dependent variable firm performance (ROA). Working capital management, which is also represented by Inventory days and the working capital to assets ratio, is the study's independent variable. Inventory days and the ratio of working capital to assets are the variables that can be changed on their own. Inventory days are a complete way to measure how quickly a company can sell its goods within a given time, taking into account theft, obsolescence, etc. Afrifa (2019) says that the definition of inventory days is the average number of days it takes for a company to get back the money it put into its inventory. Firm size, which Ferrando and Mulier (2013) say is the log of the total assets, is used as a control variable in the study and is shown along with the model that was chosen for the study.

Model 1

$$ROA_{it} = \beta_0 + \beta_1 INVD_{it+} \beta_2 WCTA_{it} + \beta_3 FSIZ_{it} + \varepsilon_{it} \quad (1)$$

Where,
ROA: Return on Assets
INVD: Inventory Days Ratio
WCTA: Working Capital to Asset Ratio.
FSIZ: Firm Size
β: Interception of the equations;
Ɛ: The error term.

$$ROA_{it} = \beta_0 + \beta_1 INVD*MO_{it+} \beta_2 WCTA*MO_{it} + \beta_3 FSIZ_{it} + \varepsilon_{it} \quad (2)$$

Where,
ROA: Return on Asset
INVD*MO: Inventory Days*Managerial Ownership.
WCTA: Working Capital to asset* Managerial Ownership.
FSIZ: Firm Size
β: Interception of the equations;
Ɛ: The error term

Results and Discussion

Descriptive Statistics

Table 1. Descriptive statistics

variable	N	mean	sd	variance	min	max	skewness	kurtosis	Prob
roa	257	5.463813	15.93745	254.0023	-179.92	53.96	-6.023286	73.90267	0.0000
invd	257	95.7907	60.00549	3600.658	11.31	515.72	3.22837	19.10355	0.0000
wcta	257	.0256031	.3212082	.1031747	-1.72	.76	-2.265661	11.91187	0.0000
fsiz	257	7.326109	.9921353	.9843324	5.24	9.38	-.1149318	2.069923	0.0001

Source: STATA 14 Output Results based on study data

According to Table 1, the typical return on assets (ROA) for publicly traded consumer and industrial products businesses in Nigeria was N5.4638. The standard deviation (SD) was 15.9375, and the variance was 254.0023. This is an indication that the ROA of the sampled firms diverge from both sides of the mean by N15.9375, which indicates that the data is widely dispersed from its mean. In other words, the mean does not adequately represent the facts. In addition, the ROA has a minimum value of –N179.92 and a high value of N53.96 accordingly.

With a coefficient of -6.0233, the ROA data are described as having a negatively skewed distribution. This indicates that the majority of the data lie on the left side of the normal curve. The broad range of N233.88 can be understood by looking at the kurtosis coefficient, which was 73.9027. This indicates that the data did not follow a normal distribution. The table also reveals that the average inventory days to (INVD) of the listed consumer and industrial goods companies in Nigeria was 95.7907 days, with a standard deviation (SD) of 60.0055 and a variance of 3600.6580. This demonstrates that the INVD of the sampled firms deviate from both sides of the mean by 60.0055 days, which indicates that the data is widely dispersed from its mean. INVD can range from 11.31 days to 515.72 days, with a total possible value of 504.41 days. The minimum value is 11.31 days and the maximum value is 515.72 days. With a coefficient of 3.2284, the data for INVD have a positively skewed distribution, which indicates that the vast majority of the points are on the right side of the normal curve. The huge range of 504.41 can be explained by the fact that the data did not follow a normal distribution, as shown by the kurtosis coefficient of 19.1035, which was found to be present. In a similar vein, the sampled companies' average working capital to total asset (WCTA) ratio over the time period of the study was 0.0256, with a standard deviation of 0.3212 and a variance of 0.1032. This was based on the results of the study. Because of this, the WCTA has a deviation of 0.3212 from both sides of the average, which indicates that the data is very spread out in relation to the mean. Moreover, the WCTA has a minimum of -1.72 days and a maximum of 0.76 days accordingly, which results in a range of 2.48 days. With a coefficient of -2.2657, the data for WCTA have a negatively skewed distribution, which indicates that the majority of the observations are on the left side of the normal curve. The broad range of 2.48 can be understood by looking at the kurtosis coefficient, which was 11.9119. This indicates that the data did not follow a normal distribution.

In addition, the data presented in Table 1 reveals that the sampled companies have an average firm size (FIZE) of 7.3261, with a standard deviation of 0.9921 and a variance of 0.9843. This demonstrates that FIZE is 0.9921 standard deviations away from the mean on both sides, which indicates that the data is very spread out in relation to the mean. The FIZE also has a minimum value of 5.24 and a maximum value of 9.38, correspondingly; this results in a range of 4.14. With a coefficient of -0.1149, the data for FIZE were found to be negatively skewed, which indicates that the vast majority of the values lie on the left side of the normal curve. The broad range of 4.14 can be understood through the use of the kurtosis coefficient, which reads 2.0699. This indicates that the data did not follow a normal distribution. The characteristics of the data, as well as the degree to which they are dispersed, have revealed that they do not follow a normal distribution and are not skewed. As a consequence of this, it became necessary to carry out diagnostic tests in order to determine whether or not the data were normal. The Shapiro-Wilk (W) data normality test was used in the study to evaluate the level of normality present in the information that was gathered. The purpose of the test was to investigate a variable that is derived from a population that follows a normal distribution. It was designed to examine the possibility of rejecting the null hypothesis that the data follow a normal distribution at a threshold of significance of 0.05. The outcomes of the examination are presented in the table that can be found above. With a confidence level of 95% and a P-Value of 0.00000, we can say that the return on assets (ROA), inventory days ration (INVD), and working capital to total assets ratio (WCTA) are all significant at the 5% level. The investigation came to the conclusion that the data for ROA, (INVD and WCTA), do not follow a normal distribution. As a result, the researchers rejected the null hypothesis and accepted the alternative hypothesis.

Correlation Matrix

Table 2. Correlation matrix

	roa	invd	wcta	invdmo	wctamo	fsiz
roa	1.0000					
invd	0.0085	1.0000				
wcta	0.4492	0.2394	1.0000			
invdmo	-0.0006	0.2020	-0.0225	1.0000		
wctamo	0.1886	0.1168	0.6397	-0.0538	1.0000	
fsiz	0.2213	-0.0149	-0.0065	-0.0271	0.1296	1.0000

Source: STATA 14 Output Results based on study data

As can be seen in Table 2, there is a marginally significant positive connection between ROA and INVD, as indicated by a correlation coefficient of 0.0085. The results also revealed a positive relationship between ROA and WCTA, with a correlation coefficient of 0.4492 indicating that if WCTA increases by one unit, it will cause ROA to increase by 0.4492 units and vice versa. This shows that a unit increase in INVD results in a 0.0085 increase in ROA. Additionally, the results revealed a positive relationship between ROA and WCTA. When inventory days are moderated by managerial ownership (INVDMO), the return on assets (ROA) has a weak negative connection with inventory days of -0.0006. As a result, a unit increase in INVDMO means that ROA will decrease by 0.0006 units and vice versa. In addition, the table demonstrates that there is a positive correlation of 0.1886 between ROA and the ratio of working capital to total assets when managerial ownership is used as a moderator (WCTAMO). This suggests that an increase in ROA of 0.1886 units is caused by a change of one unit in the WCTAMO ratio among the publicly traded consumer and industrial products companies in Nigeria over the time period under consideration.

A positive correlation was found between ROA and FIZE of the sampled companies throughout the time period of the study, as shown by the findings in Table 2, which may also be seen. This is demonstrated by the correlation value of 0.2213, which indicates that FIZE has a positive impact on ROA of listed consumer and industrial businesses in Nigeria throughout the period such that, a rise of one unit in FIZE will result in a decrease of 0.2213 unit in ROA.

Variance Inflation Factor (VIF)

Table 3. Variance Inflation Factor (VIF)

Model I			MODEL II		
Variable	VIF	1/VIF	Variable	VIF	1/VIF
invd	1.06	0.9425	invdmo	1.00	0.9967
wcta	1.06	0.9425	wctamo	1.02	0.9807
fsiz	1.00	0.9998	fsiz	1.02	0.9828
Mean VIF	1.04		Mean VIF	1.01	

Source: STATA 14 Output Results based on study data

The results of the multicollinearity test for models one and two are presented in Table 3. Results showed that INVD has a VIF of 1.06 at a tolerance of 0.9425, which indicates that the data for INVD are not highly collinear with the data for other explanatory variables; WCTA also has a VIF of 1.06 at a tolerance of 0.9425, which indicates that there was no perfect collinearity between WCTA and other independent variables; and FIZE has a VIF of 1.00 at a tolerance of 0.9998, which indicates that The fact that the average value of the variance inflation factor (VIF) for all of the explanatory variables was 1.04 in Model I and 1.01 in Model II indicates that there was not perfect multicollinearity among the independent variables. Both of these models have a VIF that is lower than 10, and their tolerance levels are higher than 0.1.

Heteroskedasticity Test

Table 4. Results of Breusch-Pagan / Cook-Weisberg test for heteroskedasticity Test

	Model I		Model II	
	Chi^2	Prob > chi2	Chi^2	Prob > chi2
Hettest	611.76	0.000	125.86	0.0000

Source: STATA 14 Output Results based on study data

For the fitted values of ROA, the Hettest Chi2 is shown to be 611.76 in Table 4. This result is significant at the 5% level of significance (P-Value = 0.000), which indicates that the model I fits the data well. As a consequence of this, the research team decided to accept the alternative hypothesis, which stated that the residuals for the fitted values of ROA exhibit heteroskedasticity. On the other hand, they decided to reject the null hypothesis, which stated that the data for the fitted values of ROA in model I demonstrate homoscedasticity. Table 5's findings also indicate that the fitted values of ROA in Model II have a Hettest Chi2 of 125.86, which is significant at a level of significance of 5% (P-Value = 0.0000). As a consequence of this, the researchers came to the conclusion that the null hypothesis was incorrect and embraced the alternative hypothesis, which said that the data for fitted values of ROA contain heteroskedasticity and call for a robust regression

Spam Test

The spam test was utilized to choose between the Pooled OLS regression and the fixed effect regression in order to evaluate whether one is more applicable. The Pooled OLS Model is the Most Appropriate Hypothesis The null hypothesis of the test is that the Pooled OLS Model is the Most Appropriate Hypothesis The alternative hypothesis is that the Fixed Effect Model is the Most Appropriate Hypothesis The decision rule is to accept the null hypothesis if the P value is larger than 5% (0.05), and to accept the alternative hypothesis if the P value is less than 5%; however, if the P value is greater than 5% (0.05), the null hypothesis must be rejected (0.05).

Table 5. Results of Spam test

	Model I without Moderation		Model II with Moderation	
	F	Prob.> F	F	Prob.> F
F test	29.81	0.0000	1.58	0.2051

Because the F value of 29.81 and the corresponding P value of 0.000 for model I and II are both less than 5% (0.05), the study rejects the null hypothesis in favor of the alternative hypothesis and draws the conclusion that fixed effect regression is the method that is best suited for Model I. The results can be found in Table 5, which can be found above. The F test performed on model II reveals a F value of 1.58, and the accompanying p value is 0.2051, which indicates a probability greater than 5%. This leads the researchers to conclude that Pooled OLS regression is the method that is best suited for Model II, and they reach this conclusion after rejecting the alternative hypothesis and accepting the null hypothesis.

LM Test

The Breusch and Pagan LM test was carried out in order to choose between the pooled OLS regression and the Random effect regression in terms of which one is superior. This test's alternative hypothesis is that random effect regression is the most acceptable method, while the test's null hypothesis assumes that pooled ordinary least squares is the most appropriate method. The decision rule states that the null hypothesis should be accepted if the PV is larger than 0.05%; alternatively, the alternative hypothesis should be accepted if the P value is less than 5%. (0.05).

Table 6. Breusch and Pagan LM test

	Model I without Moderation		Model II with Moderation	
	Chibar ^{2}	Prob.> chi^2	Chibar ^{2}	Prob.> chi^2
Breusch and Pagan LM test	85.88	0.0000	58.63	0.0000

Source: STATA 14 Output Results based on study data

According to the findings presented in the aforementioned Table 6, the chi2 value for model I was 85.88, while the chi2 value for model II was 58.63. The associated probability values were 0.0000 and 0.0000, both of which are lower than 0.05. Due to the fact that this results in the rejection of the null hypothesis and the acceptance of the alternative hypothesis, the study comes to the conclusion that the random effect model is the one that is most suitable for estimating models I and II.

Hausman Test

To choose between random effect regression and fixed effect regression, the Hausman test was used. The random effect model is assumed to be the best option in the null hypothesis, while the fixed effect model is considered the best option in the alternative. If the P value is larger than 5% (0.05), then the null hypothesis is accepted, and if it is less than 5%, then the alternative hypothesis is accepted (0.05).

Table 7. Results of Hausman test

	Model I without Moderation		Model II with Moderation	
	Chibar ^{2}	Prob.> chi^2	Chibar ^{2}	Prob.> chi^2
Hausman test	7.00	0.0720	2.15	0.3408

Source: STATA 14 Output Results based on study data

The probability values of 0.0720 and 0.3408 for models I and II, respectively, as shown in Table 7, is greater than 5%, as shown by the results of the Hausman test (0.05). The results of the spam test indicated that pooled regression was the more appropriate model for estimating model II, despite the fact that this means that the random effect regression model is best for both models.

Robust Regression

Robust regression was conducted to correct the heteroskedasticity problem in the model the result of the robust regression is presented in Table 8 below. The acceptance or rejection of the null hypothesis stated in the study is based on the results of the robust regression.

Table 8. Robust regression

```
Robust regression                                     Number of obs =     257
                                                      F(  3,   253) =   16.13
                                                      Prob > F      =  0.0000

------------------------------------------------------------------------------
         roa |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      invdmo |   -.000082   .0002363    -0.35   0.729    -.0005474    .0003833
      wctamo |   .1997896   .0400571     4.99   0.000     .1209018    .2786773
        fsiz |   1.994391   .4848606     4.11   0.000     1.039514    2.949268
       _cons |  -9.186684   3.601207    -2.55   0.011    -16.27885   -2.094521
------------------------------------------------------------------------------
```

Source: STATA 14 Output Results based on study data

The Prob.> chi2 of 0.0000 and F value of 16.13 both show that the model is significant and able to account for the observed correlation. Explained below are the coefficients, t-values, and p-values that characterize the connection between the dependent variable and each of the independent factors in the study.

H0$_1$: Inventory Days Ratio has no significant effect on return on assets when it is moderated by managerial ownership in listed industrial and consumer goods companies in Nigeria.

Inventory days did not have a significant effect on firm performance when it was moderated by ownership managerial ownership in listed industrial and consumer goods companies in Nigeria, as shown by the t value of -0.35 and the p value of 0.729, which is greater than 5%. This was supported by the fact that both of these values were greater than 5%. The result was presented in Table 8 above. According to the findings, the first alternative hypothesis is not supported by the data, so the null hypothesis, which states that there is no significant relationship between inventory days and firm performance when the relationship is moderated by managerial ownership in listed industrial and consumer goods companies in Nigeria, is accepted. This suggests that managerial ownership does not act as a moderating factor in the relationship between inventory days and financial performance. This finding is in line with the findings of Emmanuel and colleagues (2022), who discovered that management ownership does not have a substantial moderating influence on the connection between inventory days and return on asset. On the other hand, the findings of Khaled and Omar (2022) and Ugwu et al. (2020), who discovered that management ownership has a strong moderating effect on the link between inventory days and return on assets, are not in agreement with the findings presented here.

H0$_2$: Working Capital to Asset Ratio have no significant effect on return on assets when it is moderated by managerial ownership in listed industrial and consumer goods companies in Nigeria.

Working capital to total asset ratio, when moderated by management ownership, has a substantial impact on financial performance at the 5% significance level (t value 4.99, p=0.000), according to the findings in Table 8 above. The second null hypothesis is disproved in light of the findings, and the alternative hypothesis is accepted, according to which the working capital to asset ratio, when moderated by managerial ownership, significantly affects

the financial performance of listed industrial and consumer goods companies in Nigeria. The results of Randa (2022) and Bambang (2020), who discovered that management ownership significantly moderates the relationship between the working capital to asset ratio and financial performance, are in line with this one. The results, however, were at odds with those of Zalaghi et al. (2019), who discovered that when managerial ownership is controlled, the working capital to asset ratio has little impact on financial performance.

Conclusion and Recommendations

The research concludes that managerial ownership has a substantial moderating effect in the relationship between working capital management and the financial performance of consumer and industrial goods companies in Nigeria. Specifically, the study found that working capital management has a positive effect on financial performance when managerial ownership is high, but inventory days do not have a significant effect on financial performance when moderated by managerial ownership. The recommendation of the study is that consumer and industrial goods companies in Nigeria should focus on improving the efficiency and effectiveness of their working capital management to enhance their financial performance. This includes adopting stock management models that can lead to improved corporate performance. Overall, the study's conclusion and recommendations are relevant to the business environment in Nigeria and could provide useful insights for managers of consumer and industrial goods companies. However, it is important to note that the findings of the study are limited to the context of Nigeria and may not be generalizable to other countries or industries.

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