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Working Capital Management and Performance Metrics of Quoted Brewery Firms in Nigeria

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Abstract

The study set out to assess the effect of working capital management on the profitability of quoted brewery firms in Nigeria. The study used an ex post facto research design. The population consisted of 5 brewery firms quoted on the NGX as at 31st December 2022. The brewery industry was chosen using purposive and simple random sampling. A sample of 4 brewery firms with published annual reports and accounts for the period of ten years (2013-2022) was used. Data were analyzed using descriptive, inferential statistics and multiple regression with a significance level of 0.05. The findings showed that working capital had a significant effect on the return on assets of quoted brewery firms (Adj.R^2 = 0.311, F = 3.923, $p < 0.05$) and profit margin (Adj.R^2 = 0.465, F = 6.646, $p < 0.05$). In another vein, the result showed an insignificant effect on the return on equity of quoted brewery firms (Adj.R^2 = −0.076, F = 0.543, $p > 0.05$). The study concluded that working capital impacted the profitability of quoted brewery firms in Nigeria. The study recommended that the management of quoted brewery firms in Nigeria should use the working capital to drive firm performance that will attract investors.

Keywords

Account Collection Period, Account Payment Period, Inventory Conversion Cycle Period, Profit Margin, Return on Asset, Return on Equity, Working Capital Management

1. Introduction

Profitability is a fundamental driver of business that shows the performance and direction of a business entity. Without profitability, the business will not be able to survive and thrive in the long run and this has been responsible for the clo-

sure of several failed businesses across the world. It is therefore very important to measure current and past profitability and to project future profitability. A company's profitability is its ability to earn a profit. Profitability is a metric used to determine the extent of a company's performance to its size. Profitability is a measure of efficiency and effectiveness that determines a company's sustainability.

The world is a global village that is developing quickly and aggressively. Without appropriate asset management, even though a business may have everything set up and running for it, all of its efforts may not show good results if the working capital is not properly managed (Olaoye et al., 2019). Generally, companies with the appropriate and good management of working capital are more lucrative and are more likely to attract investors (Nwarogu & Iormbagah, 2017). The appropriate conduct of business is made easier by effective working capital management, which also contributes to the generation of revenue and profit for the organization (Mache & Omodero, 2021). The amount of working capital a company requires is usually defined by the industry it belongs, the number of credit days creditors allow, the number of credit days offered to debtors, and the amount of stock it must keep on hand (Etale & Oweibi, 2020; Meah et al., 2021). One of the most important components of financial decisions is managing working capital, which can be thought of as decisions that affect both working capital and liquidity. Working capital management is an essential aspect of financial management because it ensures a company is liquid enough to meet short-term obligations and unforeseen contingencies (Uguru, Chukwu, & Elom, 2018). To maximize shareholders' wealth, organizations need to manage their working capital to generate good performance and also be able to meet the payment of dividends to shareholders in the financial year. Proper working capital management aids in improving the firm's operating performance and in achieving short-term liquidity (Wassie, 2021).

The effect of COVID-19 on business operations made 2020 a particularly challenging year for many companies. Companies were urged to close across the world to stop the virus from spreading much more. A significant economic shock was generated by the impact on many enterprises, especially in the manufacturing sector, especially in terms of their cash conversion cycle (Etale & Oweibi, 2020). The pandemic era's suspension of company operations resulted in a decrease in the value of many companies' assets, and this situation had a significant impact on their needs for short-term financing, rendering them ineffective in the management of their working capital (Oko et al., 2020). The brewery industry adds value to the world GDP. The industry added $555 billion to global GDP in 2022. In 2022, the brewery industry in Nigeria had beer sales of N550.64 billion. The brewery firms that generated this sales amount for the period are Nigerian Breweries, Guinness Nigeria, International Breweries, and Champion Breweries. The 2022 sales were an increase over the 2021 figure of N437.29 billion which represents 25.86 percent. Nigeria's brewery industry was ranked 30th of 70 top beer markets in the world and contributed $2.294 billion to

the nation's GDP in 2019 (0.6 percent) of national (GDP) and created 309,200 jobs with the contribution of $526.2 billion in the country's government revenue in 2019. In the USA, the beer industry yielded $409 billion representing 1.6% of US GDP, and generated 2.4 million jobs for Americans in 2022. The Czech Republic was ranked as the largest consumer of beer in the world per capita which consumes 184.1 litres per capita annually. In Africa, South Africa was declared the most beer consumer with an average of 60 litres per person annually. Anheuser-Busch InBev, a Belgian beer firm, is the global leader in beer manufacturing with a revenue of $57.786 in 2022 followed by Heineken with a revenue of $38 billion. South African Breweries is the biggest brewery firm in Africa, a subsidiary of AB-InBev (the world's largest brewery firm) since 2016.

Current assets are often acquired in varying quantities depending on the demand structure for the firm's product. Each time a decision to acquire a current asset is made, finance becomes unavoidable. However, it does not imply that cash must be paid every time an order for recurring production input is issued; rather it implies that similar to the case with fixed assets, every decision regarding current assets has financial repercussions. Working capital management is one of the crucial aspects of financial management. It focuses on short-term financing with a close relationship between profitability and liquidity (Wassie, 2021). Effective working capital management enhances a company's operational success and helps to provide short-term liquidity. Because of this, studying working capital is crucial for both financial management and general business management.

The review of financial reports of the brewery industry revealed that profitability in the Brewery industry has not been impressive despite the sales that have been generated. The industry's financials revealed a negative average ROE and low average ROA and profit margin. Profitability is an important factor an investor looks at before parting with his resources to invest in a business. The objective of the study is to assess the effect of working capital on the return on assets, the return on equity, and the profit margin of quoted brewery firms in Nigeria. There were not many studies on this title that addressed the brewery industry though there had been studies on the consumer goods sector (Etale & Oweibi, 2020; Oko et al., 2020; Kong et al., 2019; Khalid et al., 2018; Arachchi et al., 2017). The brewery industry attracted the researchers' attention due to its contribution to the world GDP and Nigeria's GDP.

2. Literature Review

Conceptual Review

Profitability

The main objective of every business is to be profitable. If the company is not profitable, it won't last long. Oke and Adebola (2022) noted that profit maximization is the organization's driving factor. Every company's skill is its profitability (Aryawan & Indriani, 2020). As a result, it's crucial to assess current and previous profitability as well as forecast future profitability. Increasing profitability

is one of the most crucial objectives for business managers. Managers are constantly looking for ways to improve profitability through restructuring. Profitability is considered as the profit after tax in the financial statement. Profit often serves as the entrepreneur's return on investment and serves as the primary motive for business operations.

Profitability results from excess sales and expenses. Revenues represent a company's income, which shows how much money is made from selling goods or rendering services to customers (Joseph & Chiemeka, 2020). On the other hand, firm assets like cash are utilized to cover operating expenses like staff salary, utilities, rent, and other essentials in the production operation to produce profits by manufacturing and offering services (Ironkwe & Wokoma, 2017). Profitability, then, illustrates how well management uses the firm's resources to generate profit (Salami et al., 2019).

Return on Asset

Return on assets is one of the financial profitability ratios used to assess a company's performance position. According to Oladimeji and Aladejebi (2020), the ROA ratio shows the return on the amount of assets used by the company. The ROA is used to determine the efficiency of the company's overall operations that is how well the management makes use of the company's assets (Phuong & Hung, 2019). The better the ratio, the more effectively the organization can use its resources to generate profit. A financial ratio called return on assets (ROA) measures a company's profitability to its total assets. It is computed by dividing the net income by the total assets of the company.

Return on Assets (ROA) = Net Income/Total Assets.

Return on Equity

The Return on Equity ratio is the net income divided by the equity value of shareholders in the statement of financial position. Growth in ROE indicates that the company's prospects are improving the shareholders' value. ROE illustrates how well a shareholder's investment is utilized (Khalid et al., 2018). ROE is regarded as a gauge of a company's profitability and how well it produces returns for shareholders (Kong et al., 2019). The management of a firm is more effective at generating income and growth from its equity financing when it produces a higher ROE.

Net Profit Margin

The net profit margin ratio can be used to calculate the company's profit from operations. Net Profit Margin (NPM) is a metric for profit that contrasts profit after interest and tax with sales. Because a strong corporation may produce a big net profit through its sales activities, this ratio demonstrates that the larger the ratio, the more investors demand for the company's shares which may drive the share price higher (Ajayi et al., 2017).

Working Capital

Working-capital management involves some key elements related to company finances, i.e., short-term receivables, inventories, cash, and short-term liabilities (Olaoye et al., 2019). Gross working capital is the total cost of a company's cur-

rent assets, i.e., all of its assets that can be converted into cash within a year (Khalid et al., 2018). Current assets include accounts receivables, raw material inventory, work-in-progress inventory, finished goods inventory, cash and bank balance, marketable securities like T-Bills and commercial paper, as well as short-term investments (Salami et al., 2019).

Average Collection Period (ACP)

Accounts receivable are revenues that are due, or what customers and debtors owe a company for previous sales (Ajayi et al., 2017). To pay its debts and operating expenses, a business must promptly collect its receivables. On a company's balance sheet, accounts receivable appear as assets, but they do not become assets until they are paid (Babatunde & Akeju, 2017). Analysts use a metric called "days sales outstanding" to evaluate how efficiently a firm manages its receivables. The metric shows how long it typically takes a business to collect sales revenues. A positive correlation between Accounts Receivable and a company's profitability was reported by Jakpar et al. (2017), Alvarez et al. (2021), and Amponsah-Kwatiah and Asiamah (2020). Some scholars (Prsa, 2020; Samuel & Abdulateef, 2016) have been unable to determine any significant relationship between Accounts receivable and profitability.

Average Payment Period (APP)

Accounts payable is a crucial part of working capital management since it refers to the amount that a business must pay out soon. Companies work to keep a proper balance between payments and receivables to maximize cash flow. Companies may delay payments for as long as it is practical to do so to keep their credit ratings high and keep their suppliers and creditors happy. The ideal ratio between a company's average time to collect receivables and its average time to settle payables is significantly less (Leah et al., 2022).

A significant positive relationship between Account payables and profitability was established in previous studies (Payne, 2019). In turn, by utilizing this cash to finance investments in short-term assets, corporations can increase profits by delaying paying creditors' payments for a long period (Alvarez et al., 2021). On the other hand, a negative relationship between APP and profitability was reported by Chand et al. (2019).

Inventory Conversion Cycle Period

A company's main asset that generates sales revenues is its inventory. A company's performance is determined by how quickly it sells and replenishes its stock. An indication of the strength of sales as well as the effectiveness of the company's purchasing and manufacturing processes is the inventory turnover rate, according to investors. Low inventory levels imply a potential revenue loss for the organization, while extremely high inventory levels could signify a waste of working capital. Olaoye et al. (2019) reported a high level of inventory which protects businesses from losing sales and reduces their risk of incurring breakage costs in their supply chain.

Some studies were carried out on the relationship between the Inventory conversion cycle and a firm's profitability which included Prsa (2020); Mache and

Omodero (2021); Ntuli and Nzuzza (2022).

Theoretical Review

Resource-Based Theory

Resource based theory prpounded by Wernerfelt in 1984 is regarded as one of the most widely referenced theories of strategic management. The organization's resource-based view (RBV) is a competitive advantage strategy that arose in the 1980s and 1990s, after the works of academics and businessmen such as Birger Wernerfelt, Prahalad and Hamel, Spender, and Grant. Most academics, however, regard Jay Barney as the founder of the contemporary "Resource-Based View of the Firm (RBV)". His theory ('91) proposed firms can have heterogeneity, or distinctions at the firm level, that allow some to maintain a competitive advantage.

According to resource-based theory, the best resources for a company's long-term success are those that are treasured, rare, hard to replicate, and non-substitutable (Barney, 1991; Peteraf, 1993). These strategic resources can lay the foundation for the development of firm skills and improved productivity over time.

The primary ingredients of manufacturing that ensure the firm's success and long-term viability are resources. The cognitive ability of business managers to ensure effective administration of the organization's short-term assets is included in this study using resources-based theory (Alvarez et al., 2021). Every component of a firm used in generating income is regarded as a resource. In this sense, resources include current assets, long-term non-current assets, and human resources that are not included in the balance sheet of a firm. Human resources play a significant role in coordinating other resources to achieve the desired objectives of the company. As a result, resources are implied to be the source of a firm's capability.

Some of the criticisms leveled at the theory include the following: 1) there are no considerations in the resource-based view, 2) the resource-based view presumes endless regress which may not be possible, 3) the resource-based view's practicality is too restricted, 4) continued competitive advantage is not achievable, and 5) the worth of a resource item is too ambiguous to provide a useful theory.

It takes into account all available resources inside the corporation to fulfill the company's goals. According to the theory, a company's sustainability and long-term performance are best served by scarce, difficult-to-replicate, and non-substitute resources. It is also more practical to capitalize on external opportunities with existing resources rather than learning new skills for each opportunity.

Empirical Review

Working Capital and ROA

Joseph and Chiemeka (2020) examined working capital management and the financial performance of listed oil and gas companies in Nigeria. The research design adopted was expost facto. The findings revealed that the cash conversion cycle and the average period of debt settlement had a negative and significant

effect on the return on assets but the average collection period had a positive effect on the return on assets of listed oil and gas companies in Nigeria. This is in tandem with the study of Salami et al. (2019) which also examined working capital management and financial performance of listed petroleum firms in Nigeria. The study revealed a negative and significant effect of the cash conversion cycle, average collection period, and inventory turnover period on the return on assets of the petroleum firms in Nigeria. The study of Kong et al. (2019) showed a significant relationship between liquidity and financial performance (measured by ROA) of quoted non-financial firms in Ghana which was in tandem with the work of Salami et al. (2019).

Golas (2020) examined the causative link between working capital management and Performance in milk processing companies. This research was done using micro-data for Polish dairy companies from 2008-2017 obtained from the Emerging Information Service (EMIS) database. The regression analysis was used. The research used Days Sales of Inventory (DSI), Days Sales Outstanding (DSO), Days Payable Outstanding (DPO), and Cash Conversion Cycle (CCC) as the independent variables and the Return on Assets (ROA) as the dependent variable. The findings revealed that DSI and CCC hada negative effect on ROA when extended. DSO and DPO had a positive and significant impact on ROA. It was concluded that working capital management significantly impacted profitability.

Khalid et al. (2018) aimed to work out the impact of working capital management on profitability. For six years, 2007-2012, data from chosen companies in the electrical equipment sector listed on the Karachi stock exchange were acquired. The acquired data was subjected to regression analysis. The tests on normality and linearity were also used. The research used Current Ratio, Debt to Equity Ratio, Operating Profit to Debt Ratio, and Inventory Turnover Ratio to measure the independent variable and the Return on Assets (ROA) as the dependent variable. The alternate hypothesis was accepted and it was concluded that working capital management has a significant positive impact on firms' profitability.

Oyedele et al. (2017) examined working capital management and financial performance, evidence from Nigerian Breweries Plc. An ex-post facto research design was adopted using extracts from the company's audited annual reports and accounts of the company between 2011 and 2016. The Independent variable is represented by the cash conversion cycle (CCC), inventory conversion period (ICP), debtor conversion period, and creditor conversion period (DCP) while the dependent variable is represented by the return on assets (ROA). The findings showed that CCC had a negative and significant relationship with ROA but there was a negative and insignificant relationship between ICP, DCP, CCP, and ROA.

Working Capital and ROE

Kong et al. (2019) examined liquidity and financial performance looking at the correlational analysis of quoted non-financial firms in Ghana. The research

design was ex post facto. The dependent variables used were ROA, ROCE, and ROE. The findings showed that liquidity had an insignificant effect on the performance of the firms.

In another study, Oko et al. (2020) did an empirical study on working capital management policies and firms' performance of manufacturing firms in Nigeria. Secondary data was obtained from the annual reports of sampled companies listed on the Nigeria Exchange Group (NGX). Multiple regression analysis was used to test the hypotheses with the help of the E-view application. The findings showed that investment policy had a significant effect on ROE but financial policy had a negative and significant effect on ROE.

Working Capital and Profit Margin

Oladimeji and Aladejebi (2020) examined the impact of working capital management on the profitability of SMEs in Nigeria. This study used secondary data extracted from the annual reports of the selected SMEs for a period of 5 years; 2014-2018. The regression analysis method was adopted. Account Collection Period, Inventory Conversion Period, Average Payment Period, Cash Conversion Cycle, Debt, Current Ratio, and Quick Ratio were used to measure the independent variable and the Return on Assets was used to measure the dependent variable. The analysis revealed that there is no relation between working capital management and SME profitability. It also put forward that government strategies should be directed towards the enhancement of SME growth.

Phuong and Hung (2019) looked at the influence working capital management has on the profitability of firms in Vietnam. A sample of 5295 firms listed on the Vietnam stock market was used, and the data gathered span from 2009-2018. The Generalized Least Squares (GLS) regression method was used. The study used Inventory Turnover, Average Receivables, Average Payment, and Cash Conversion Cycle to measure the independent variables and the Return on Assets to measure the dependent variable. The findings showed that Inventory turnover, average receivables, average payment, and cash conversion cycle negatively impacted the firm's profitability. Working capital should be optimized to increase firms' profitability and avoid a negative impact on the firm performance.

Ajayi et al. (2017) examined the impact of working capital management on the financial performance of quoted consumer goods manufacturing firms in Nigeria. The study made use of secondary data in its methodology. The findings revealed a significant improvement in working capital management on the firm's financial performance. This is in tandem with the works of Khalid et al. (2018) and Babatunde and Alkeju (2017) who investigated working capital management and profitability in which working capital management was found to have a considerable positive impact on business profitability.

Conceptual Framework

The conceptual framework of the study (working capital and profitability of quoted brewery firms in Nigeria) is shown in **Figure 1**.

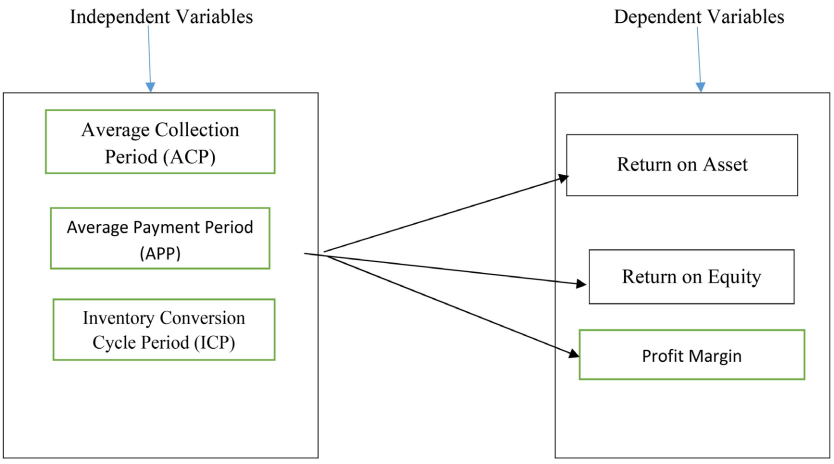

Figure 1. Conceptual framework. Source: Author's model.

3. Methodology

Research Design

Research design used for the study is ex-post facto research design which made use of secondary data generated from the published annual accounts of the sampled Brewery companies in Nigeria. Descriptive research design was also used to describe the relationship between the dependent and independent variables.

Population of the Study

This study's population consists of five firms in the brewery industry listed on the Nigerian Exchange Group as at 31st December, 2022. The study considered brewery firms that have up-to-date information for the period of research (2013-2022). There were five brewery firms listed on the Nigerian Exchange Group as at 31st December, 2022 which are Nigerian Breweries Plc, Guinness Nigeria Plc, Champion Breweries Plc, International Breweries Plc, and Golden Guinea Breweries Plc.

Sample Size

The sample of this study was restricted to listed brewery companies in Nigeria to know the specific effect of working capital management on their profitability from 2013 to 2022. Simple random sampling was used to select brewery firms for the study, which gives opportunity to every brewery firm of being selected. The brewery industry was chosen considering its contribution to the GDP of Nigeria. Taro Yamane's (1967) formula was used to determine the sample size.

Thus, they are as follows;

$$n = N/1 + \left(N * e^2\right)$$

where n = Appropriate sample size;

N = Population Size;

e = Margin of error unit (5% or 0.05);

$n = 5/(1 + 5(0.05)^2) = 4.93 = 5$ approximately.

The sample size for the study is 4 due to the availability of annual reports and

accounts of the quoted brewery companies on the Nigerian Exchange Group as of 31st December 2022. Four companies that had complete information on the study's variables were used. Golden Guinea Brewery plc was not considered due to incomplete annual reports and accounts for the period of the study (2013-2022).

Sampling Techniques

The sampling technique for the study was simply random where every member of the industry is entitled to selection. Simple random, purposive and stratified sampling techniques were adopted to select the Brewery industry from the consumer goods industry due to the cost of obtaining data for the study. Using Taro Yamane's formula, the sample size from 5 Brewery companies, four of them were used due to the availability of data.

Data Collection Method

The data utilized in this study were obtained from secondary sources and retrieved through analysis of the content of financial statements from 2013 to 2022. The source is trustworthy because the company's accounts have been confirmed by independent auditors. The 10-year period covered was sufficient to assess whether or not there was an effect between the adopted variables.

Method of Data Analysis

The panel data methodology was used in the study, which included pooled regression, fixed-effect estimation, and random-effect estimation techniques. Panel data allows you to probe and at the same time explore both cross-sectional and time series data. The result of the analysis was used to test the hypotheses of the study. The data analysis technique used was E-View package version 12.0.

Model Specification

The model specification of the study is shown below following balanced panel data of Ordinary Least Square (OLS).

$$\mathrm{ROA} = f\left(\mathrm{APP}, \mathrm{ACP}, \mathrm{ICP}\right) \quad \text{(Equation 1)}$$

$$\mathrm{ROE} = f\left(\mathrm{APP}, \mathrm{ACP}, \mathrm{ICP}\right) \quad \text{(Equation 2)}$$

$$\mathrm{PAT} = f\left(\mathrm{APP}, \mathrm{ACP}, \mathrm{ICP}\right) \quad \text{(Equation 3)}$$

$$\mathrm{ROA}_{it} = \alpha_0 + \beta_1 \mathrm{APP}_{it} + \beta_2 \mathrm{ACP}_{it} + \beta_3 \mathrm{ICP}_{it} + \mathrm{e}_{it} \quad \text{(Model 1)}$$

$$\mathrm{ROE}_{it} = \alpha_0 + \beta_1 \mathrm{APP}_{it} + \beta_2 \mathrm{ACP}_{it} + \beta_3 \mathrm{ICP}_{it} + \mathrm{e}_{it} \quad \text{(Model 2)}$$

$$\mathrm{PAT}_{it} = \alpha_0 + \beta_1 \mathrm{APP}_{it} + \beta_2 \mathrm{ACP}_{it} + \beta_3 \mathrm{ICP}_{it} + \mathrm{e}_{it} \quad \text{(Model 3)}$$

where;

ROA = Return on Asset ROE = Return on Equity PAT = Profit after Tax;

APP = Average Payment Period ACP = Average Collection Period ICP = Inventory Conversion Period;

β_0 = Coefficient of the parameter estimate;

$\beta_1 - \beta_3$ = intercept;

μ_{it} = Error term;

t = year or period;

i = firm.

4. Results, Interpretation, and Discussion

Descriptive Analysis

The descriptive statistics presented in Table 1 show the mean, standard deviation, minimum, and maximum of the explanatory variables measured by Average collection period (ACP), Average payment period (APP), and Inventory cycle period (ICP). The dependent variables are measured by the Return on Assets (ROA), Return on Equity (ROE), and Profit margin.

Table 1 shows the summary statistics of all the variables obtained from the sampled quoted brewery firms in Nigeria. The mean value for the data set of the Average collection period (ACP) is 69.35 days. The difference between the minimum value of 3 days and the maximum value of 127 days showed the extent to which brewery firms vary from each other in the average collection period. The standard deviation for ACP is 33.98. The standard deviation measures the extent of dispersion from the mean which suggests some levels of fluctuation in the data. A low standard deviation indicates that the data points tend to be very close to the mean, while a high standard deviation reflects that the data points are spread out over a large range of values.

The mean value for the data set of the Average payment period (APP) is 241.58 days. The difference between the minimum value of 84 days and the maximum value of 1722 days showed the extent to which brewery firms vary from each other in the average payment period. The standard deviation for APP is 279.12 days. The standard deviation measures the extent of dispersion from the mean which suggests some levels of fluctuation in the data. A low standard deviation indicates that the data points tend to be very close to the mean, while a high standard deviation reflects that the data points are spread out over a large range of values.

The mean value for the data set of the Inventory cycle period (ICP) is 68.05 days. The difference between the minimum value of 30 days and the maximum value of 133 days showed the extent to which brewery firms vary from each other in the inventory cycle period. The standard deviation for ICP is 17.31 days. The standard deviation measures the extent of dispersion from the mean which suggests some levels of fluctuation in the data. A low standard deviation indicates that the data points tend to be very close to the mean, while a high standard deviation reflects that the data points are spread out over a large range of values.

The mean value for the data set of the Return on assets (ROA) is 5.07 percent. The difference between the minimum value of −18.94 percent and the maximum value of 24.62 percent showed the extent to which brewery firms vary from each other in return on assets. There was a company that reported the worst result of a negative return of 18.94 percent while a brewery firm reported the best return of 24.62 percent. The standard deviation for ROA is 8.96. The standard deviation measures the extent of dispersion from the mean which suggests some levels of fluctuation in the data. A low standard deviation indicates that the data points tend to be very close to the mean, while a high standard deviation reflects that the data points are spread out over a large range of values.

Table 1. Descriptive statistics.

Variables	ROA	ROE	PMARGIN	ACP	APP	ICP
Mean	5.073917	−1.997	6.295	69.35	241.575	68.05
Maximum	24.62431	38	33	127	1722	133
Minimum	−18.93723	−372	−53.3	3	84	30
Std. Dev.	8.961689	61.42729	16.8853	33.98382	279.1167	17.31155

Source: Researcher's computation (2023).

The mean value for the data set of the Return on equity (ROE) is −1.997 percent. The difference between the minimum value of −372 percent and the maximum value of 38 percent showed the extent to which brewery firms vary from each other in the return on equity. There was a brewery company that reported the worst result of a negative return of 372 percent while a brewery firm reported the best return of 38 percent. The standard deviation for ROE is 61.43. The standard deviation measures the extent of dispersion from the mean which suggests some levels of fluctuation in the data. A low standard deviation indicates that the data points tend to be very close to the mean, while a high standard deviation reflects that the data points are spread out over a large range of values.

The mean value for the data set of Profit margin (PMargin) is 6.29 percent. The difference between the minimum value of −53.3 percent and the maximum value of 33 percent showed the extent to which brewery firms vary from each other in profit margin. There was a brewery company that reported the worst result of the negative return of 53.3 percent while a brewery firm reported the best return of 33 percent. The standard deviation for PMargin is 16.89. The standard deviation measures the extent of dispersion from the mean which suggests some levels of fluctuation in the data. A low standard deviation indicates that the data points tend to be very close to the mean, while a high standard deviation reflects that the data points are spread out over a large range of values.

The correlation analysis table above shows the association between the explanatory variables used in this study. The table shows the multicollinearity among the variables. Table 2 shows that the Average Collection Period (ACP) is positively related to the Average Payment Period and Inventory Conversion Period. Average Collection Period has the highest correlation value with a value of 0.473 while Inventory Conversion Period has the lowest correlation value with a value of −0.3073.

The average Payment Period has a low positive relationship with the Average Collection Period having a 0.021 correlation value showing that they move in the same direction. Average Payment Period has a negative relationship with the Inventory Conversion Period having a −0.3072 correlation value showing that APP and ICP are moving in opposite directions.

Test of hypotheses

Regression Analysis for Hypothesis One

Table 2. Correlation analysis.

	ACP	APP	ICP
ACP	1	0.020682	0.473074
APP	0.020682	1	−0.3073
ICP	0.473074	−0.307299	1

Interpretation

Post-Estimations Test Results

To determine the most appropriate method of estimating the regression Model One for brewery firms among pooled OLS, fixed effects, and random effects results as presented in Table 3, the fixed/random effects test was carried out; and based on the result of the test with the *p-value* of 0.00, which is less than the 5 percent level of significance chosen for the study revealed that fixed effects are the most appropriate estimator according to its null hypothesis which states that there is the presence of unsystematic difference in the model coefficients; thus, the study rejected the null hypothesis. This is the reason for the choice of fixed effect for this model.

Regression Equation Results

$$\mathrm{ROA}_{it} = \alpha_0 + \beta_0 \mathrm{APP}_{it} + \beta_2 \mathrm{ACP}_{it} + \beta_3 \mathrm{ICP}_{it} + \mu_{it} \quad \text{(Model 1)}$$

$$\mathrm{ROA}_{it} = 9.44 - 0.0478\mathrm{ACP}_{it} - 0.016\mathrm{APP}_{it} + 0.0436\mathrm{ICP}_{it} + \mu_{it} \quad \text{(Model 1a)}$$

Model One in Table 3 examined the effect of working capital on the return on assets of quoted brewery firms in Nigeria. The regression estimates results revealed that ACP has a negative and insignificant effect on ROA (β = −0.0478, p = 0.356). The negative value of its coefficient implies that a unit of ACP will lead to a marginal decrease of 0.0478 percent in the Return on Assets. Table 3 also revealed that APP has a negative and insignificant effect on Return on Assets (β = −0.016, p = 0.0013); which means that a unit of APP will lead to a marginal decrease of 0.016 percent in Return on Asset of selected brewery firms in Nigeria. The table also showed that ICP has a positive and insignificant effect on return on asset (β = 0.0436, p = 0.6815) which implies that every unit of ICP will lead to a marginal increase of 0.0436 percent in return on asset.

The R-squared showed the variation between the variables. The independent variables could only explain 31.05% of the variation of the dependent variable. It showed that other factors outside the independent variables that accounted for 68.95% were responsible for variation in the ROA of Brewery firms in Nigeria.

Decision

At a level of significance of 0.05, degree of freedom of 2, and F-statistics (3.927) of model one, the p-value is 0.0045 which is less than the chosen level of significance. Therefore, the study rejected the null hypothesis which stated that working had no significant effect on return on assets and we accepted an alternate hypothesis which stated that working capital had a significant effect on return on assets. This indicated that working capital was necessary to impact the

Table 3. Estimation results for model one.

Dependent Variable: ROA

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.43655	6.720813	1.404079	0.1696
ACP	−0.04788	0.051154	−0.93595	0.3561
APP	−0.0166	0.004711	−3.5232	0.0013
ICP	0.043601	0.105288	0.414106	0.6815
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.416598	Mean dependent var		5.073917
Adjusted R-squared	0.310524	S.D. dependent var		8.961689
S.E. of regression	7.441309	Akaike info criterion		7.009599
Sum squared resid	1827.312	Schwarz criterion		7.305153
Log-likelihood	−133.192	Hannan-Quinn criter.		7.116462
F-statistic	3.927454	Durbin-Watson stat		0.921618
Prob(F-statistic)	0.00453			

Source: Researcher's computation (E-Views 12) 2023; Note: All the analyses were tested at a significant level of 5%.

business to generate a good return on assets for the companies and that the assets are put to good use by the business managers.

Regression Analysis for Hypothesis Two

To determine the most appropriate method of estimating the regression Model Two for brewery firms among pooled OLS, fixed effects, and random effects results as presented in Table 4, the fixed/random effects test was carried out; and based on the result of the test with the *p-value* of 0.00, which is less than the 5 percent level of significance chosen for the study revealed that fixed effects are the most appropriate estimator according to its null hypothesis which states that there is the presence of unsystematic difference in the model coefficients; thus, the study rejected the null hypothesis. This is the reason for the choice of fixed effect for this model.

Regression Equation Results

$$\mathrm{ROE}_{it} = \alpha_0 + \beta_1 \mathrm{APP}_{it} + \beta_2 \mathrm{ACP}_{it} + \beta_3 \mathrm{ICP}_{it} + \mu_{it} \quad \text{(Model 2)}$$

$$\mathrm{ROE}_{it} = 26.545 - 0.0319\mathrm{ACP}_{it} - 0.027\mathrm{APP}_{it} - 0.2905\mathrm{ICP}_{it} + \mu_{it} \quad \text{(Model 2a)}$$

Model Two in Table 4 examined the effect of working capital on the return on equity of quoted brewery firms in Nigeria. The regression estimates results revealed that ACP has a negative and insignificant effect on ROE (β = −0.0319, p = 0.9423). The negative value of its coefficient implies that a unit of ACP will lead to a marginal decrease of 0.0319 percent in Return on equity. Table 4 also revealed that APP has a negative and insignificant effect on Return on equity (β = −0.0271, p = 0.5056); which means that a unit of APP will lead to a marginal

Table 4. Estimation results for model two.

Dependent variable: ROE

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	26.54487	57.53987	0.46133	0.6476
ACP	−0.031943	0.43795	−0.07294	0.9423
APP	−0.027142	0.040331	−0.67298	0.5056
ICP	−0.29052	0.90142	−0.32229	0.7493
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.089837	Mean dependent var		−1.997
Adjusted R-squared	−0.075648	S.D. dependent var		61.42729
S.E. of regression	63.70836	Akaike info criterion		11.30414
Sum squared resid	133938.9	Schwarz criterion		11.59969
Log-likelihood	−219.0827	Hannan-Quinn criter.		11.411
F-statistic	0.54287	Durbin-Watson stat		2.248295
Prob(F-statistic)	0.771729			

decrease of 0.0271 percent in Return on equity of selected brewery firms in Nigeria. The table also showed that ICP has a negative and insignificant effect on return on equity (β = 0.2905, $p = 0.749$) which implies that every unit of ICP introduced will lead to a marginal decrease of 0.2905 percent in return on equity.

The R-squared showed the variation between the variables. The independent variables could not explain the variation in the dependent variable as it resulted in negative. It shows that other factors outside the independent variables accounting for more than 100% were responsible for variation in the ROE of brewery firms in Nigeria.

Decision

At a level of significance of .05, degree of freedom of 2, and F-statistics (0.54287) of model two, the p-value is 0.7717 which is higher than the chosen level of significance. Therefore, the study could not reject the null hypothesis which stated that working had no significant effect on return on equity and we could not accept the alternate hypothesis which stated that working capital had a significant effect on return on assets. This indicated that working capital had no impact on return on equity which may cause demotivation to any investor.

Regression Analysis for Hypothesis Three

Estimation Results for Model Three

Dependent variable: PMARGIN

To determine the most appropriate method of estimating the regression Model Three for brewery firms among pooled OLS, fixed effects, and random effects results as presented in Table 5, the fixed/random effects test was carried out; and based on the result of the test with the *p-value* of 0.00, which is less than the 5 percent level of significance chosen for the study revealed that fixed effects are

Table 5. Estimation results for model three.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	16.59569	11.15646	1.487542	0.1464
ACP	−0.04041	0.084915	−0.47583	0.6373
APP	−0.04117	0.00782	−5.26486	0
ICP	0.035959	0.174777	0.20574	0.8383
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.547165	Mean dependent var		6.295
Adjusted R-squared	0.464832	S.D. dependent var		16.8853
S.E. of regression	12.35247	Akaike info criterion		8.023218
Sum squared resid	5035.257	Schwarz criterion		8.318771
Log-likelihood	−153.464	Hannan-Quinn criter.		8.130081
F-statistic	6.645716	Durbin-Watson stat		0.983296
Prob(F-statistic)	0.000112			

Source: Researcher's computation (EViews 12) 2023; Note: All the analyses were tested at a significant level of 5%.

the most appropriate estimator according to its null hypothesis which states that there is the presence of unsystematic difference in the model coefficients; thus, the study rejected the null hypothesis. This is the reason for the choice of fixed effect for this model.

Regression Equation Results

$$\text{PMARGIN}_{it} = \alpha_0 + \beta_1 ACP_{it} + \beta_2 APP_{it} + \beta_3 \text{ICP}_{it} + \mu_{it} \quad \text{(Model 3)}$$

$$\text{PMARGIN}_{it} = 16.596 - 0.0404\text{ACP}_{it} - 0.04117\text{APP}_{it} + 0.03596\text{ICP}_{it} + \mu_{it} \quad \text{(Model 3a)}$$

Model Three in Table 5 examined the effect of working capital on the profit margin of quoted brewery firms in Nigeria. The regression estimates results revealed that ACP has a negative and insignificant effect on PMARGIN (β = −0.0404, p = 0.6373). The negative value of its coefficient implies that a unit of ACP will lead to a marginal decrease of 0.0404 percent in profit margin. Table 5 also revealed that APP has a negative and significant effect on profit margin (β = −0.04117, p = 0.000); which means that a unit of APP will lead to a marginal decrease of 0.04117 percent in the profit margin of selected brewery firms in Nigeria. The table also showed that ICP has a positive and insignificant effect on profit margin (β = 0.03596, p = 0.8383) which implies that every unit of ICP introduced will lead to a marginal increase of 0.03596 percent in profit margin.

The R-squared showed the variation between the variables. The independent variables could only explain 0.4648 in the variation to the dependent variable representing 46.48%. It shows that other factors outside the independent variables accounting for 53.52% were responsible for the variation in the profit

margin of brewery firms in Nigeria.

Decision

At a level of significance of 0.05, degree of freedom of 2, and F-statistics (6.6457) of model three, the p-value is 0.000 which is less than the chosen level of significance. Therefore, the study rejected the null hypothesis which stated that working had no significant effect on profit margin and we accepted the alternate hypothesis which stated that working capital had a significant effect on profit margin. This indicated that working capital had a mixed result on the profit margin of quoted brewery firms in Nigeria.

Discussion of Findings

Model One

The regression results in model one investigated the relationship between working capital and return on asset of quoted brewery firms in Nigeria and found that ACP and APP had a negative effect on the return on assets of quoted brewery firms in Nigeria. ICP had a positive effect on return on assets. On statistical significance, ACP and ICP had no statistical significance on return on assets while APP had a significant effect on return on assets.

There was a mixed result with the result of Joseph and Chiemeka (2020) which revealed that the cash conversion cycle and an average period of debt settlement had a negative but significant effect on the return on assets of listed oil and gas firms in Nigeria. The average collection period has a positive effect on the return of assets of listed oil and gas firms in Nigeria. This study is in tandem with Joseph and Chiemeka (2020) where the cash conversion cycle and an average period of debt settlement had a negative and significant effect on the return on assets of listed oil and gas firms in Nigeria and this study reported a negative and significant effect of APP on return on assets of brewery companies in Nigeria. This study is not in tandem with the study of Joseph and Chiemeka (2020) where ACP had a positive effect on the return on assets of listed oil and gas firms in Nigeria but this study showed a negative effect on the return on assets of the breweries industry in Nigeria.

This study is not in agreement with the work of Golas (2020) which examined the causative link between working capital management and performance in milk processing companies. Golas (2020) reported a negative effect of Days sales of inventory (DSI) on return on assets but this study reported a positive effect of ICP on the return on assets of quoted brewery firms in Nigeria. There was a disagreement between the two reports where Golas (2020) reported a positive effect of Days sales outstanding (DSO) and Days payable outstanding (DPO) but this study reported a negative effect of ACP and APP on return on assets of brewery firms in Nigeria. The Days payable outstanding and APP between the two reports are in agreement as they reported a significant effect on return on assets. In hypothesis testing, this study is in agreement with Golas (2020) who accepted that working capital management had a significant effect on return on assets.

Oladimeji and Aladejebi (2020) examined the impact of working capital management on the profitability of SMEs in Nigeria. Account Collection Period, In-

ventory Conversion Period, Average Payment Period, Cash Conversion Cycle, Debt, Current Ratio, and Quick Ratio were used to measure the independent variable and Return on Assets was used to measure the dependent variable. The analysis revealed that there was no relationship between working capital management and SME profitability. This is not in tandem with this study which found a significant relationship between working capital and profit margin of brewery firms in Nigeria.

The work of Kong et al. (2019) which examined the correlational analysis of liquidity and financial performance of quoted non-financial firms in Ghana is in tandem with this study. Kong et al. (2019) reported that liquidity had a significant relationship with the financial performance of the firms as measured by ROA while this study showed a significant relationship between working capital and return on assets ($\beta = 3.927$, p-value = 0.0045).

Phuong and Hung (2019) examined the influence of working capital management on the profitability of firms in Vietnam. The study used Inventory Turnover, Average Receivables, Average Payment, and Cash Conversion Cycle to measure the independent variables and Return on Assets to measure the dependent variable. It was discovered through the study that Inventory turnover, average receivables, average payment, and cash conversion cycle negatively impacted firms' profitability. This has a mixed result with this study because only ACP and APP had negative effects while ICP had a positive effect on the return on assets of brewery firms in Nigeria.

Olaoye et al. (2019) examined working capital management and firm's profitability: evidence from quoted firms on the Nigerian Exchange Group. They reported that only cash payment time had a significant impact on return on assets, while cash collection had the opposite effect. Also, both the current ratio and the inventory period had a positive impact on the return on assets, indicating that working capital management had an impact on company performance in Nigeria. Olaoye et al. (2019) reported an insignificant effect of cash collection on return on assets which is in tandem with this study but also reported a negative and insignificant ACP effect on return on assets. There was a disagreement between the two in the payment period where Olaoye et al. (2019) reported a significant effect of cash payment on return on assets but this study reported an insignificant effect of APP on the return on assets of brewery firms in Nigeria. There was also a disagreement in the inventory collection cycle between them. Olaoye et al. (2019) reported a positive impact of inventory period on return on assets but this study reported a negative effect of ICP on return on assets.

Salami et al. (2019) examined working capital management and financial return of listed petroleum firms in Nigeria and reported that the cash conversion cycle, average collection period, and inventory turnover period had a significant negative impact on return on assets and return on sales. This is a mixed result with this study as this study reported a negative effect of APP and ACP on return on assets but a positive effect of ICP on return on assets. This study also deferred an insignificant effect of ACP and ICP but only APP showed a signifi-

cant effect on the return on assets of brewery firms in Nigeria.

Nwarogu and Iormbagah (2017) examined cash management and performance of quoted firms in Nigeria. They reported that cash conversion cycle and cash holding had a significant positive relationship with firms' return on assets all had, whereas cash flow and firm size had a negative relationship with return on assets. This is not in tandem with this study that reported a negative and insignificant effect of ACP on the return on assets of brewery firms in Nigeria (β = -0.04788, p-value = 0.3561).

In this model, the work of Kong et al. (2019) is in tandem with this study which reported that liquidity had a significant relationship with financial performance. The works of Golas (2020), Oladimeji and Aladejebi (2020), and Nwarogu and Iormbagah (2017) did not agree with this study. The works of Joseph and Chiemeka (2020), Olaoye et al. (2019), Phuong and Hung (2019), and Salami et al. (2019) had mixed results with this study.

Model 2

The regression results in model two investigated the relationship between working capital and return on equity of quoted brewery firms in Nigeria. It was revealed that the null hypothesis could not be rejected because of the p-value which is 0.7717 more than 0.05 level of significance. The result showed that all the independent variables (APP, ACP, and ICP) had negative and insignificant effects on the return on equity of quoted brewery firms in Nigeria.

This study is in tandem with the study of Kong et al. (2019) which examined the correlational analysis of liquidity and financial performance of quoted non-financial firms in Ghana. They reported an insignificant relationship with the financial performance of the firms as measured by ROE.

Oko et al. (2020) carried out an empirical study on working capital management policies and firms' performance of selected manufacturing firms in Nigeria. The study found that there was a significant effect of aggressive investment policy on ROA, ROE, and Tobin Q (firms' performance). The study also showed a significant negative effect of aggressive financial policy on firms' performance (ROA, ROE, and Tobin Q). The result of Oko et al. (2020) is in tandem with this study which reported negative effects of all independent variables (APP, ACP, and ICP) on the return on equity of brewery firms in Nigeria.

Nwarogu and Iormbagah (2017) examined cash management and performance of quoted firms in Nigeria and the results revealed that the variables, firm size, firm growth, and cash flow, all had a negative relationship on the Return on Equity model. This is in tandem with this study which showed negative and insignificant effects on return on equity.

Ironkwe and Wokoma (2017) carried out a study on working capital management and firms' financial performance of oil companies in Nigeria and reported a negative and insignificant relationship between investing policy and financial policy on return on equity. This is in tandem with the results of this study.

The results above showed that this study is in tandem with all the authors

who had worked on working capital and performance of companies in Nigeria showing negative and insignificant effects of independent variables on return on equity.

Model Three

The regression results in model three investigated the relationship between working capital and profit margin of quoted brewery firms in Nigeria and found that ACP and APP had a negative effect on the profit margin of quoted brewery firms in Nigeria. ICP had a positive effect on profit margin. On statistical significance, ACP and ICP had no statistical significance on profit margin while APP had a significant effect on the profit margin of brewery firms in Nigeria.

Etale and Oweibi (2020) examined the working capital management profitability of Dangote Sugar Company quoted on Nigerian Exchange Group (NGX) and reported that all the independent variables had a positive relationship with profit after tax, but only net working capital was significant at 5%. This has a mixed result with this study which reported negative effects of APP and ACP but only ICP had a positive effect on the profit margin of quoted brewery firms in Nigeria.

Khalid et al. (2018) carried out a study on working capital management and profitability and reported a considerable positive impact of working capital management on business profitability. This is in tandem with the hypothesis testing of model three which found working capital positive and significant on profit margin. Babatunde and Akeju (2017) examined the impact of working capital management on firms' profitability, evidence from Nigeria, and reported a significant positive relationship between working capital management and firms' profitability, measured by gross operating profit. This is in tandem with this study in hypothesis testing of model three which found working capital significant on profit margin and rejected the null hypothesis.

The work of Etale and Oweibi (2020) showed mixed results with this study. Khalid et al. (2018) and Babatunde and Akeju (2017) supported this study which showed that working capital had a significant effect on profit margin.

Implication of findings

The analyses carried out from various models of the study showed mixed results which have implications for various stakeholders in the brewery industry. The stakeholders may include investors and shareholders, policymakers, professionals, scholars, industry managers, regulators, customers, suppliers, and the general public.

Investors and shareholders: Investors can see from the findings of this study the extent to which working capital impacts the performance of quoted brewery firms in Nigeria. The variations in the data set of working capital and profitability of the sampled companies throughout the study as shown by a high degree of dispersion and regression results implied evidence of fluctuations in the performance of quoted brewery firms in Nigeria. This will help investors evaluate appropriately the performance of quoted brewery firms in Nigeria for portfolio decisions as well as other aspects of investment decisions.

It is important to recognize that shareholders are more concerned about the performance of the companies they invest their funds in. They want to ensure that their investment is in safe hands and can also generate appropriate returns to compensate for their risk in the investment. They want to ensure that the return is commensurate with the risk hence they consider the risk process and policies important for the safety of their investment. The independent variables (APP, ACP, and ICP) appear critical to investors. Also, there is evidence of a decline in financial performance during periods of economic downturn.

The findings of model one showed poor collection and payment by the brewery firms quoted on the Nigerian Exchange Group as APP and ACP had a negative effect on return on assets. The results on model two (return on equity) did not look good as all the independent variables (APP, ACP, and ICP) had a negative effect on return on equity. This implies that shareholders might not enjoy a good dividend at the end of the year. Model three findings revealed that APP had a negative insignificant effect and ACP had a negative significant effect on the profit margin but ICP had a positive insignificant effect on the profit margin of brewery firms in Nigeria.

Company Management: The company management needs to pay attention to the collection and payment strategy of their respective companies to stem the negative trends. The average collection days from descriptive statistics showed 69 days while the minimum day is 3 days and the maximum is 127 days. The table also showed a moderate standard deviation of 33.98. The average payment period took 241 days about eight months to pay creditors. This is not a sign of a good business to relate with. Creditors will be scared to supply goods to such companies. No wonder they showed a negative effect on all dependent variables. The result also showed the minimum payment period as 84 days (almost three months) and the maximum payment period as 1722 days (more than four years) to settle creditors. There was a large variation in payment period showing a standard deviation of 279.11. The average inventory conversion cycle is 68 days. The minimum inventory conversion cycle is 30 days and the maximum is 133 days. This implies that the stocks are turned over between one month and four months and 13 days. The standard deviation is 17.31 which is very moderate for the kind of business they are engaged in. The inventory conversion cycle had a positive effect on return on assets and profit margin but sustained a negative effect on return on equity. The return on equity of the brewery industry was not impressive for the period of study as the average return on equity showed a negative figure of −1.997. The minimum return on equity showed a negative figure of −372% and a maximum of 38% with a standard deviation of 61.427. This could be attributable to why the independent variables had a negative effect on return on equity. The average return on assets was 5.07%, the minimum was a negative figure of −18.94%, and the maximum was 24.62% with a standard deviation of 8.96%. This could also be responsible for the negative effect of APP and ACP on the return. The average profit margin was 6.295%, the minimum was a negative figure of −53.3%, and the maximum of 33% with a standard deviation

of 16.89. The management should look into those areas outside the independent variables that are affecting their operations which impeded returns on business.

5. Summary, Conclusion, and Recommendations

Summary

The study empirically investigated the effect of working capital on the profitability of quoted brewery firms in Nigeria. In carrying out this study, there were two main variables considered, the dependent variable and the independent variable. The dependent variable, profitability, was measured using proxies such as Return on Asset (ROA), Return on Equity (ROE), and Profit margin (PMargin). The independent variable, working capital, was measured by the proxies of Account payment period (APP), Account collection period (ACP), and Inventory conversion cycle (ICP).

The result of the descriptive statistics revealed that variations exist in the data among the companies within the industry for the period under study which might result in their various performances due to account payment period (APP), account collection period (ACP), and inventory conversion cycle period (ICP).

The first hypothesis assessed the effect of working capital on the return on assets of quoted brewery firms in Nigeria for the period of 2013-2022. The result of the F-statistics with a probability value ($\beta = 3.927$, p-value = 0.0045) implies that working capital positively and significantly impacted the return on assets of quoted brewery firms in Nigeria hence the null hypothesis was rejected which stated that working has no significant effect on return on assets and the alternate hypothesis that working capital has a significant effect on return on asset of brewery firms was accepted.

The second hypothesis investigated the effect of working capital on the return on equity of quoted brewery firms in Nigeria for the period of 2013-2022. The result of the F-statistics with a probability value ($\beta = 0.543$, p-value = 0.772) implies that working capital positively and insignificantly impacted the return on equity of quoted brewery firms in Nigeria hence the null hypothesis could not be rejected which stated that working capital has no significant effect on return on equity and the alternate hypothesis that working capital has a significant effect on return on equity of brewery firms could not be accepted.

The third hypothesis examined the effect of working capital on the profit margin of quoted brewery firms in Nigeria from 2013 to 2022. The result of the F-statistics with a probability value ($F = 6.646$, p-value = 0.000) implies that working capital positively and significantly impacted the profit margin of quoted brewery firms in Nigeria hence the null hypothesis which stated that 2 working capital has no significant effect on profit margin was rejected and the alternate hypothesis that working capital has a significant effect on the profit margin of brewery firms in Nigeria was accepted.

Conclusion

It was concluded that

1) The account collection period had a negative and insignificant effect but the Average payment period had a negative and significant effect on the return on assets of brewery firms in Nigeria. The inventory conversion cycle period had a positive and insignificant effect on return on assets.

2) The study examined the effect of working capital on the profitability of quoted brewery firms in Nigeria. To achieve this main objective effectively, three (3) working capital measurements were selected and analyzed namely; APP, ACP, and ICP from 2013-2022 through descriptive analysis and multiple regression. Having reviewed the extant literature about the relationship between working capital and the profitability of brewery firms in Nigeria, deriving hypotheses from literature and theories, data collection, and data analysis, the study concluded that the effect of working capital on the profitability of quoted brewery firms in Nigeria differed in the measures of working capital and profitability indicators as well as the relationship that co-existed between them. There were some differences thrown out among the independent variables against the dependent variables.

The study is in tandem with Resource-based theory, and Stakeholders theories. The effects of independent variables on the dependent variables indicated the signal to shareholders, management, board members, policymakers, suppliers, employees, and government on what decision to take concerning the industry. Stakeholder theory also reveals various parties that are involved and affected by the performance of the industry. The dismal performance of a company will prevent the government from receiving the company's income tax, VAT payments, education tax, and other levies. Resource-based theory points to the fact that various resources are combined to produce a result that generates returns from which dividend is paid to shareholders, distribution is made to employees, tax is paid to the government, and retained earnings are used by the company for future expansion. Profitability in this study is proxied by return on assets, return on equity, and profit margin. Working capital is proxied by APP, ACP, and ICP.

Lastly, the study concluded that working capital measures (APP, ACP, and ICP) boosted the profitability of quoted brewery firms in Nigeria. The results agreed with some findings in literature such as Kong et al. (2019), Phuong and Hung (2019), Salami et al. (2019), Olaoye et al. (2019), and Joseph and Chiemeka (2020).

Recommendations

In line with the results and findings obtained in each of the hypotheses, the following recommendations were made which might be useful to the management, investors and shareholders, the policymakers, the government, and other stakeholders:

1) To the Managers: The management of brewery firms should pay attention to ICP that produced a positive effect on return on assets. The regression results showed that every unit of ICP introduced generated a marginal increase of 0.04%

in return on assets. Serious attention should be paid to the payment period as it takes an average of 241 days (8 months) to settle trade creditors. This will have a negative impact on the image of the company and pike performance on the floors of the Nigerian Exchange Group (NGX).

2) To the investors: Shareholders and potential investors need to be conversant with factors that impact the return on their investment. The regression results showed a negative effect of APP, ACP, and ICP on the return on equity of quoted brewery firms in Nigeria. In making a choice, a potential investor may be tempted to invest his fund in the industry not knowing some of the financial performance issues confronting them. Attention should be paid to financial indicators by the investors to watch where they invest in their funds.

3) To financial analysts, researchers, and scholars: The results from the study will serve as a useful empiric for financial analysts and researchers as this study appears to be a unique one that covered the industry as there are not many studies that have been extended to this industry. Financial analysts require this kind of study in portfolio selection for their clients hence they should partner with the academics for more research in this area. Profitability is very key in any business but this should be backed by liquidity for sustainable continuity in business.

Research limitation

Though the study had made substantial contributions to knowledge, some limitations were identified as listed below:

1) Non-availability of financial statements of some companies which reduced the number of companies that could be used for the study. We could not include Golden Guinea Brewery due to the non-availability of financial statements for the period under study.

2) The timing and cost for the collection of data was enormous. It discouraged researchers from carrying out studies regularly.

Suggestions for Further Studies

This study advances the following suggestions for the benefit of extending the boundaries of knowledge and for further research studies related to working capital and profitability of brewery firms in Nigeria.

1) Further studies could consider other sectors of the capital market not yet researched and other variables. This will help to have sector-specific solutions instead of having a general solution of one cap fits all.

2) The period may be reduced to cover more companies that are newly established.

Conflicts of Interest

There was no conflict of interest in the study

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