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# Effect of Working Capital Management on Financial Performance of Marshal Plant and Chemical Industries in Enugu, Enugu State

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## Abstract

*This study examines the effect of working capital management on the financial performance of Marshal Plant and Chemical Limited in Enugu, Enugu State. Employing a panel data methodology with a fixed effects regression model, the research utilizes secondary data spanning from 2009 to 2023 to assess the relationship between Accounts Receivable Turnover Ratio (ARTR), Inventory Turnover Ratio (ITR), and Cash Conversion Cycle (CCC) on Annual Profit (AP). The analysis reveals statistically significant positive relationships between ARTR, ITR, and CCC with AP. Specifically, higher ARTR (coefficient: 1.431, p-value: 0.0207), ITR (coefficient: 0.710, p-value: 0.0279), and CCC (coefficient: -0.249, p-value: 0.0320) are associated with increased Annual Profit. The study validates theoretical frameworks on working capital management by demonstrating that efficient management of receivables, inventory, and cash conversion processes can enhance profitability. Based on these findings, the research provides actionable recommendations for improving working capital practices within the paint industry, contributing to both academic literature and practical financial management strategies. The results offer valuable insights for similar firms in the manufacturing sector, emphasizing the critical role of operational efficiency in achieving financial success*

***Keywords:*** *Working capital management, financial performance, Accounts receivable turnover ratio, Inventory turnover ratio & Cash conversion cycle.*

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**Introduction**

Effective working capital management is crucial for the financial health and operational efficiency of businesses, including those in the paint industry. Working capital, defined as the difference between a company's current assets and current liabilities, plays a significant role in maintaining liquidity, ensuring smooth operations, and fostering growth (Khan & Jain, 2021). For industries such as paint manufacturing, where inventory management, production scheduling, and credit policies are pivotal, effective management of working capital can substantially influence overall performance.

In the context of paint industries, managing working capital efficiently is especially critical due to the nature of their operations, which involves substantial inventory and receivables. Paint companies like Marshal Plant and Chemical Limited in Enugu, Nigeria, often face challenges related to fluctuating raw material costs, variable demand, and extended credit terms offered to customers (Oboh & Akinbode, 2022). These factors can impact the company's liquidity and operational efficiency, making effective working capital management a vital component for sustaining competitive advantage and achieving financial stability.

Previous studies have shown that poor working capital management can lead to inadequate liquidity, higher borrowing costs, and operational disruptions (Eljelly, 2004). Conversely, efficient working capital management can enhance profitability, reduce financial costs, and support business growth (Deloof, 2003). For instance, research conducted by Falope and Ikediashi (2014) highlighted that effective management of receivables and inventory significantly improves the profitability of manufacturing firms.

Marshal Plant and Chemical Limited, situated in Enugu, Enugu State, serves as a relevant case study for this research due to its significant role in the regional paint industry. Analyzing the impact of working capital management practices at this company can provide insights into how such practices affect financial performance and operational efficiency within the paint sector. The findings from this study aim to contribute to a better understanding of the relationship between working capital management and business performance, offering valuable implications for both academic research and industry practice.

**Statement of the Problem**

In an ideal situation, effective working capital management ensures that a company is able to maintain sufficient liquidity to meet its short-term obligations while optimizing the use of its assets to support smooth operations and growth. For paint industries such as Marshal Plant and Chemical Limited, this involves striking a delicate balance between managing inventory levels, handling receivables and payables efficiently, and ensuring cash flow stability to support continuous production and market responsiveness.

However, Marshal Plant and Chemical Limited is currently grappling with significant challenges in its working capital management. The company is facing issues such as prolonged inventory turnover periods, delayed collections of receivables, and elevated levels of short-term debt. These difficulties are further compounded by the volatility in raw material costs and the extended credit terms often extended to customers, resulting in liquidity constraints and operational inefficiencies.

If these problems are not addressed, the repercussions could be severe. Persistent liquidity issues may lead to higher borrowing costs and operational disruptions, negatively impacting profitability. Over time, such financial strain could erode the company's competitive advantage and financial stability, threatening its ability to sustain operations and growth. Consequently, if unresolved, these working capital management issues could ultimately undermine the company's market position and overall financial health.

**Objectives of the Study**

The main objectives of the study is to assess the impact of effective working capital management in paint industries (A case study of Marshal Plant and Chemical Limited Enugu, Enugu State), while the specific objectives are to:

i. Evaluate the effect of accounts receivable turnover ratio (ARTR) on profit for the year (PFTY) of Marshal Plant and Chemical Limited
ii. Assess the effect of inventory turnover ratio (ITR) on profit for the year (PFTY) of Marshal Plant and Chemical Limited
iii. Examine the effect of cash conversion cycle (CCC) on profit for the year (PFTY) of Marshal Plant and Chemical Limited

**Research Questions**

The study provided answers to the following research questions:

i. To what extent does the accounts receivable turnover ratio (ARTR) affect the profit for the year (PFTY) of Marshal Plant and Chemical Limited?
ii. What is the effect of inventory turnover ratio (ITR) on the profit for the year (PFTY) of Marshal Plant and Chemical Limited?
iii. To what extent does the cash conversion cycle (CCC) influence the profit for the year (PFTY) of Marshal Plant and Chemical Limited?

**Statement of Hypotheses**

The following hypotheses in null form guided the study:

i. There is no significant effect of the accounts receivable turnover ratio (ARTR) on the profit for the year (PFTY) of Marshal Plant and Chemical Limited.
ii. There is no significant effect of the inventory turnover ratio (ITR) on the profit for the year (PFTY) of Marshal Plant and Chemical Limited.
iii. There is no significant effect of the cash conversion cycle (CCC) on the profit for the year (PFTY) of Marshal Plant and Chemical Limited.

**Scope of the Study**

This study investigates the impact of effective working capital management on the financial performance of paint industries, with a specific focus on Marshal Plant and Chemical Limited in Enugu State. The research spans from 2009 to 2023 and aims to evaluate how key components of working capital management—specifically, Accounts Receivable Turnover Ratio (ARTR), Inventory Turnover Ratio (ITR), and Cash Conversion Cycle (CCC)—influence the company's Profit for the Year (PFTY). By analyzing financial data from the company's annual reports, the study will examine the relationship between these working capital metrics and the profitability of Marshal Plant and Chemical Limited. The research will utilize secondary data sources, including financial statements and annual reports, to assess how these aspects of working capital management impact the company's financial outcomes. In addition, qualitative insights into the implementation of working capital management practices within the company will be explored to provide a comprehensive understanding of how these strategies contribute to operational efficiency and overall financial health. This research will contribute valuable insights to the field of financial management by providing practical implications for industry practitioners and enhancing academic knowledge of effective working capital strategies in the paint industry.

**Operational Definition of Terms**

i. **Working Capital Management:** Refers to the process of managing the company's short-term assets and liabilities to ensure sufficient liquidity for daily operations. It involves optimizing the balance between accounts receivable, inventory, and accounts payable to maintain smooth operational efficiency and financial stability.

ii. **Accounts Receivable Turnover Ratio:** This ratio measures how efficiently a company collects its receivables. It is calculated by dividing net credit sales by the average accounts receivable during a specific period. In this study, it assesses the impact of the company's efficiency in collecting receivables on its annual profit.

iii. **Inventory Turnover Ratio:** This ratio indicates how effectively a company manages its inventory. It is computed by dividing the cost of goods sold (COGS) by the average inventory during a specific period. This study uses it to evaluate how well inventory management practices influence annual profit.

iv. **Cash Conversion Cycle (CCC):** The Cash Conversion Cycle (CCC) is a financial metric used to measure the efficiency of a company in managing its working capital. It represents the number of days it takes for a company to convert its investments in inventory and other resources into cash flows from sales.

v. **Profit for the year:** Profit for the Year (PFTY) refers to the net profit that a company earns during a specific period, typically a fiscal year. It represents the company's total revenue minus all its expenses, taxes, and costs incurred during that period. It is also commonly known as Net Income or Net Profit.

vi. **Financial Performance:** This encompasses the overall financial health of the company as measured by profitability, efficiency, and return on investment. In this study, it is primarily assessed through changes in annual profit as influenced by working capital management ratios.

**Review of Related Literature**

**Conceptual Review**

**Concept of Working Capital Management**

Working capital management encompasses the strategic oversight of a company's short-term assets and liabilities to ensure adequate liquidity for daily operations while optimizing operational efficiency. It is a critical aspect of financial management that affects a company's ability to meet its short-term obligations and invest in its growth opportunities. Effective working capital management is essential for maintaining operational efficiency, financial health, and overall business sustainability. Key components of working capital include inventory, accounts receivable, accounts payable, and cash. Efficient management of these elements helps in balancing liquidity with profitability, reducing the cost of capital, and minimizing financial risks (Khan & Jain, 2023). Proper working capital management involves continuous monitoring and adjustment of these components to align with the company's operational requirements and market conditions.

**Account Receivables Turnover**

Accounts Receivable Turnover (ART) is a key financial metric that assesses how efficiently a company manages and collects its receivables. This ratio measures the number of times receivables are converted into cash within a given period, providing insights into the firm's credit management effectiveness. The formula for calculating the Receivables Turnover Ratio is:

Receivables Turnover Ratio = NCS ÷ AAR

A higher ratio indicates efficient collection practices, as it reflects a shorter time between making a sale and receiving cash (Brigham & Ehrhardt, 2022). Conversely, a lower ratio may suggest issues with collections or overly lenient credit policies, which could impact cash flow (Koller, Goedhart, & Wessels, 2020). Effective management of accounts receivable involves several key steps: setting appropriate credit terms, monitoring collections closely, evaluating the liquidity of receivables, and adjusting credit policies based on customer payment behaviors (D'Arcangelo, 2021). By regularly assessing and managing these aspects, companies can maintain a healthy cash flow and minimize the risk of bad debts. Modern financial practices emphasize integrating ART with other performance metrics to gain a comprehensive view of financial health and operational efficiency.

**Inventory Management**

Inventory management is a vital component of working capital management that significantly impacts production efficiency and sales performance. The inventory turnover ratio, which measures the frequency at which inventory is sold and replaced within a specific period, serves as a key performance indicator for inventory management efficiency. A high inventory turnover ratio indicates effective inventory management practices, efficient use of resources, and strong sales performance. Conversely, a low turnover ratio may signal issues such as overstocking, obsolescence, or slow-moving inventory, which can lead to increased holding costs and liquidity problems (Gordon

& Noguera, 2022). Effective inventory management strategies involve accurate demand forecasting, just-in-time inventory systems, and regular inventory audits to optimize stock levels and minimize associated costs.

**Cash Conversion Cycle (CCC)**

The Cash Conversion Cycle (CCC) is a key financial metric that measures the efficiency of a company in managing its working capital. It represents the time it takes for a company to convert its investments in inventory and other resources into cash flows from sales. This cycle involves three major components: Days Sales Outstanding (DSO), Days Inventory Outstanding (DIO), and Days Payables Outstanding (DPO). Each component of the CCC can be influenced by various factors, including the company's operational efficiency, financial practices, and asset management. While the CCC primarily pertains to current assets and liabilities, understanding the role of long-term assets, such as Property, Plant, and Equipment (PP&E), is essential for a comprehensive analysis of working capital management.

**The Role of PP&E in the Cash Conversion Cycle**

Property, Plant, and Equipment (PP&E) represent long-term, tangible assets like land, buildings, machinery, and vehicles, which are critical for a company's production activities (Brigham & Ehrhardt, 2022). Though PP&E are not directly part of the current assets involved in the CCC, their management has an indirect impact on the company's overall cash flow and, consequently, on the efficiency of the cash conversion cycle.

Impact on Inventory Management (DIO): PP&E, especially machinery and equipment, are central to the production process. The efficiency and capacity of these assets directly influence how quickly a company can produce goods and, therefore, how efficiently inventory can be managed. For instance, outdated or poorly maintained machinery might slow down production, increasing the Days Inventory Outstanding (DIO). On the other hand, well-maintained and modernized equipment can optimize production speed and reduce inventory holding times, positively impacting the CCC (D'Arcangelo, 2021).

Influence on Cash Flow and Capital Investment: Investments in PP&E typically involve large capital expenditures, which can affect a company's liquidity and cash flow. As PP&E are long-term assets, they don't directly contribute to the current cash flows used in the CCC. However, the strategic management of PP&E, through efficient asset utilization or timely replacement, can indirectly affect cash inflows by increasing operational efficiency. Properly managed assets lead to higher productivity, which can boost sales and shorten the receivable collection period (Brigham & Ehrhardt, 2022). Conversely, poorly managed or underutilized assets can increase maintenance costs and reduce the overall efficiency of operations, thereby potentially elongating the CCC.

Depreciation and Tax Implications: The systematic allocation of the cost of PP&E through depreciation (except for land) plays a role in financial reporting and tax management (Koller, Goedhart, & Wessels, 2020). Depreciation expenses affect net income and, consequently, cash flow by reducing taxable income. As companies may defer tax payments through depreciation, it can have a delayed effect on cash flow. However, excessive depreciation can also reduce the perceived value of the company's assets, influencing its financial position and possibly its ability to secure working capital financing, which in turn affects the company's ability to manage its CCC effectively.

Impairment of PP&E: Companies must periodically assess PP&E for impairment, which occurs when the carrying amount of an asset exceeds its recoverable amount (D'Arcangelo, 2021). An impairment can lead to a significant write-down, affecting both the balance sheet and cash flow. If a company's PP&E assets are impaired, it may need to invest in new equipment or machinery to restore operational efficiency, which could lead to increased capital expenditure. These changes in asset value and capital outflows can influence the company's liquidity and working capital management, potentially affecting the CCC.

**Technological Integration in PP&E Management and CCC Efficiency**

With the increasing reliance on technology, asset management software and data analytics have become crucial in managing PP&E effectively (Koller, Goedhart, & Wessels, 2020). These tools can help companies monitor the condition of their PP&E, schedule maintenance, and make more informed decisions about when to replace or upgrade assets. By reducing downtime and improving asset efficiency, technology can help reduce inventory holding times (DIO), streamline production, and improve receivables management (DSO), thereby contributing to a more efficient cash conversion cycle.

Moreover, advanced analytics can assist in forecasting capital needs and assessing the best times for asset investment or disposal. This contributes to the strategic alignment of PP&E management with the broader goal of enhancing cash flow, which is an essential factor in managing the CCC.

**The Role of Effective Working Capital Management in Enhancing Financial Performance**

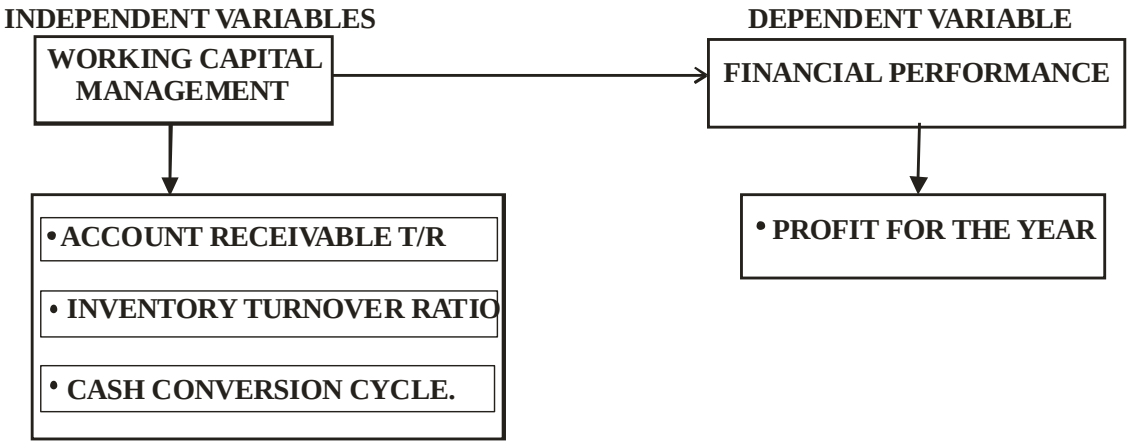
Effective working capital management is crucial for a company's financial health and operational efficiency. It involves optimizing the balance between a company's current assets and current liabilities to ensure sufficient liquidity for day-to-day operations while minimizing the costs of holding excess inventory or having large amounts of cash tied up in receivables. This balance is vital for maintaining smooth operations and avoiding potential liquidity issues (Brigham & Ehrhardt, 2022).

The impact of effective working capital management extends across various aspects of a company's operations. Proper management of working capital ensures that a company can meet its short-term obligations and avoid liquidity crises. By efficiently managing inventory, accounts receivable, and accounts payable, a firm can enhance its cash flow, reduce financing costs, and improve profitability (Koller, Goedhart, & Wessels, 2020). Effective working capital management also leads to better credit terms with suppliers and customers, as it demonstrates the company's reliability in handling its financial commitments (D'Arcangelo, 2021).

Furthermore, companies that excel in working capital management often experience lower operational costs and can reinvest the freed-up capital into growth opportunities, such as expanding production capabilities or pursuing new market opportunities. This strategic use of working capital can provide a competitive advantage and contribute to long-term success. Conversely, poor working capital management can result in financial distress, increased borrowing costs, and missed growth opportunities (Higgins, 2023).

In summary, the impact of effective working capital management is profound, influencing both the liquidity and overall financial performance of a company. It is a key factor in driving operational efficiency, improving profitability, and enhancing a company's strategic flexibility. Understanding and implementing robust working capital management practices are essential for maintaining financial stability and achieving sustainable business growth.

**Conceptual Framework**




**Source:** ***Authors Conceptualization, 2024***

**Fig. 2.1:** Conceptual framework of the impact of effective working capital management.

**Theoretical Framework**

The theoretical framework for this study is grounded in the Cash Conversion Cycle (CCC) and supported by the Working Capital Management Theory. The Cash Conversion Cycle Theory is particularly pertinent to analyzing working capital management in the paint industry, with a focus on Marshal Plant and Chemical Limited. This theory examines the time span between the expenditure of cash for raw materials and the receipt of cash from sales of finished products. It encompasses three critical components: the inventory conversion period, the receivables collection period, and the payables deferral period (Brigham & Ehrhardt, 2022).

The inventory conversion period measures the time required for inventory to be transformed into finished goods and sold. For a paint manufacturer like Marshal Plant and Chemical Limited, optimizing this period is essential to minimize holding costs and enhance liquidity. The receivables collection period evaluates the speed at which the company collects payments from customers post-sale. Efficient management of accounts receivable is crucial for improving cash flow and reducing reliance on external financing. Lastly, the payables deferral period pertains to the duration taken to settle payments with suppliers. Effective management of payables helps in optimizing cash outflows and maintaining a healthier cash flow (Brigham & Ehrhardt, 2022).

The Working Capital Management Theory complements this framework by focusing on the efficient management of a company's short-term assets and liabilities to ensure liquidity and operational stability. This theory emphasizes balancing profitability with risk, particularly through optimal levels of inventory, receivables, and payables. For Marshal Plant and Chemical Limited, effective working capital management is vital for operational efficiency,

ensuring the company can meet short-term obligations while capitalizing on growth opportunities. This balance is crucial in the paint industry, where managing inventory levels and supplier and customer credit directly impacts production continuity and sales (Brigham & Ehrhardt, 2022).

Additionally, this theory aids in understanding how managing working capital influences cash flow. Efficient management can shorten the cash conversion period and reduce the need for external financing, which is essential for maintaining financial health and operational flexibility. By focusing on optimal working capital practices, the company can enhance profitability by lowering holding costs, minimizing stockouts, and optimizing credit terms, thereby improving overall financial performance.

**Empirical Reviews**

Okphiabhele et al. (2022) conducted a study investigating the relationship between working capital management and profitability in Nigeria's industrial goods sector. The study adopted a quantitative research design using data from the Nigerian Exchange Group Factbook (2011-2020) with 70 observations. The study finds a positive linear relationship between working capital management variables and Return on Assets (ROA), with the Current Ratio showing a negative and significant relationship, while other ratios had positive but insignificant correlations. The authors recommend optimizing short-term financial management strategies to enhance profitability.

Ijuwo (2024) conducted an ex post facto study investigating the effect of working capital management (WCM) on the profitability of ten listed consumer goods companies in Nigeria from 2017 to 2022. The study adopted a panel data analysis framework employing fixed and random effect regression models, as well as tests for heteroscedasticity. The study finds that the cash conversion cycle (CCC) has a positive and significant coefficient, indicating that extending the cash conversion cycle is associated with increased profitability. Additionally, fluctuations in inventory turnover, accounts receivables, and payables, along with firm characteristics like size and leverage, may not be robust determinants of profitability. The findings emphasize the need for tailored WCM strategies that reflect specific industry characteristics. The research highlights the importance of managing the cash conversion cycle effectively for optimizing financial health and operational effectiveness in Nigeria's consumer goods sector.

Ekwochi et al. (2021) conducted a study investigating the effect of working capital management on the productivity of manufacturing companies in the South East States of Nigeria. The study adopted a panel data methodology analyzing a balanced panel of ten listed firms from 2008 to 2017. The study finds that the cash collection period and cash payment period negatively impacted Return on Assets (ROA), with the cash payment period showing a significant effect (−0.064, $p = 0.000 < 0.05$), while the cash collection period had a less significant impact (−0.032, $p = 0.077 > 0.05$). Additionally, both the current ratio and inventory period positively affected ROA, with the current ratio displaying a significant impact (8.172, $p = 0.000 < 0.05$), while the inventory period's effect was not significant (0.045, $p = 0.438 > 0.05$). This study highlights the critical role of effective working capital management in enhancing the productivity of manufacturing firms in the region.

Gimba and Bagobiri (2023) conducted a study examining the effect of working capital management on the financial performance of listed industrial firms in Nigeria from 2011 to 2020. The study adopted a quantitative approach using secondary data from the financial reports of ten out of thirteen firms due to data inaccessibility. The study finds that accounts receivable had a negative significant effect on return on assets (ROA), while the cash conversion cycle and accounts payable were found to be insignificant. The authors recommend ensuring adequate inventory levels to meet customer demands, minimizing the cash conversion cycle, maintaining a suitable period for settling accounts with suppliers, and developing strategies to encourage timely payments from debtors to enhance financial performance.

Tarighi et al. (2024) conducted a study investigating the impact of the COVID-19 crisis and firm risk on working capital management policies among manufacturing firms listed on the Tehran Stock Exchange (TSE). The study adopted a quantitative approach analyzing a sample of 1,200 observations from 200 companies over a six-year period (2016-2021) using ordinary least squares (OLS) regression. The study finds that the COVID-19 pandemic prompted managers to increase several working capital metrics, including the current assets to total assets ratio (CATAR), current ratio (CR), quick ratio (QR), net working capital (NWC), and cash to current assets (CTCA) ratio, while leading to a decrease in the operational cycle (OC), days accounts receivable (DAR), and current liabilities to total assets ratio (CLTAR). Additionally, higher company risk motivated managers to adopt working capital investment policies, enhancing NWC, cash to current assets ratio, and cash conversion efficiency (CCE). The findings suggest that during crises, Iranian companies implement conservative working capital policies to ensure adequate liquidity, aligning with the theory of liquidity preference.

Alayemi and Salaudeen (2020) conducted a study examining the strategic role of efficiency in cash management, specifically focusing on cash generated from operations among manufacturing companies in Nigeria. The study adopted a quantitative approach analyzing annual cash flow statements from selected manufacturing firms over a ten-year period (2009-2018) using various statistical tests, including the Pooled Test, Random Test, Fixed Effect, and Hausman Test. The study finds that efficiency significantly impacts cash management, with proxies like Cash Utilization to Liquid Capital (CULC), Long-Term Debt to Capital (LTDC), Interest Coverage Ratio (INTC), and Earnings at Risk (EARQ) showing notable effects. The study emphasizes the importance of cash generated from operations as a reliable means of funding, recommending that manufacturing companies prioritize operational cash generation to enhance their financial stability.

Onyimba et al. (2023) conducted a study to empirically examine the effect of accounts receivable management on the profitability of selected pharmaceutical firms listed on the Nigerian Stock Exchange from 2014 to 2018. The study adopted a quantitative approach focusing on the average collection period as the independent variable and gross operating profit as the dependent variable, controlling for liquidity, financial assets to total assets, firm size, and leverage. The study finds that the average collection period had a negative and significant impact on profitability, indicating that a shorter collection period could enhance profitability. This suggests that firms can increase profitability by implementing a tighter trade credit policy, leading to improved cash flow and reduced bad debt. The study highlights the importance of effective accounts receivable management in optimizing financial performance within the pharmaceutical sector.

Kithinji et al. (2022) conducted a study examining the effect of accounts payable management on the financial performance of public universities in Kenya. The study adopted a quantitative research design focusing on 31 accredited public universities from 2016 to 2019, utilizing secondary data collected from the Auditor General's office. The study finds that accounts payable turnover management and accounts payable day ratio management significantly influence financial performance, with a coefficient of determination ($R^2$) of 0.563, indicating that 53.6% of the variation in financial performance can be attributed to changes in accounts payable management. Additionally, student enrollment moderates the relationship between accounts payable management and financial performance. The authors conclude that effective accounts payable management is essential for improving the financial health of public universities in Kenya and recommend adopting robust management practices, along with further research on private universities for broader generalization.

Nguyen and Patel (2024) conducted a study on accounts payable management and its influence on financial stability in the Paint Sector." Using a mixed-method approach, the researchers combined quantitative analysis of financial ratios with qualitative interviews from 30 paint companies. Their findings revealed that effective management of accounts payable positively impacts financial stability by optimizing cash outflows. Companies that strategically extended their payables deferral periods, without straining supplier relationships, saw improvements in cash flow and liquidity. The study also emphasized the importance of negotiating favorable credit terms with suppliers to enhance overall financial stability.

Johnson and Lee (2022) explored the impact of accounts receivable management on cash flow: evidence from manufacturing firms." This research utilized a panel data approach, analyzing financial statements and accounts receivable data from 100 manufacturing firms over a five-year period. The study applied panel regression techniques to assess the effects of accounts receivable management on cash flow. The results highlighted that effective management of accounts receivable is crucial for maintaining positive cash flow. Firms with shorter receivables collection periods experienced better cash flow stability and lower days sales outstanding (DSO). The research also noted that stricter credit policies and automated collection systems significantly improved cash flow management.

**Gap in Literature**

Despite extensive research on working capital management across various industries, there remains a notable gap in the literature concerning its impact specifically within the paint industry. While numerous studies have explored the relationship between working capital management and financial performance in broader manufacturing sectors or service industries, there is limited empirical evidence focusing on the paint industry, particularly in the context of Nigerian firms.

Existing research often highlights general working capital management practices and their effects on profitability, but few studies address how specific ratios—such as accounts receivable turnover, inventory turnover, and cash conversion cycle affect financial outcomes within specialized sectors like paint manufacturing. These specific ratios are crucial for understanding how effectively companies manage their working capital to influence profitability, yet they remain under-explored in the context of paint industries, especially in emerging economies.

Moreover, much of the existing literature focuses on large-scale multinational corporations, leaving a gap in understanding how working capital management practices are applied in medium-sized, regionally-focused companies such as Marshal Plant and Chemical Limited. This gap in sector-specific and company-size-specific research underscores the need for an analysis tailored to the unique characteristics of smaller or medium enterprises in developing markets.

Additionally, much of the existing literature relies on data from developed economies, which may not fully capture the unique financial dynamics and challenges faced by companies in developing countries like Nigeria. For instance, factors such as inflation, currency fluctuations, and regulatory environments have distinct effects on Nigerian firms, yet these elements are often overlooked in studies focused on more stable and developed economies. This gap in geographical and sector-specific research highlights the importance of a focused study on the paint industry within the Nigerian context.

By addressing these gaps, this study aims to provide valuable insights specific to the paint industry and contribute to a more nuanced understanding of working capital management practices in emerging markets. This research will help bridge the existing literature divide and offer practical implications for companies operating in similar contexts, particularly in developing economies.

## Methodology

### Research Design

This study adopted an *ex-post facto* research design. The ex-post facto design was chosen because it relied on existing data and historical events. In this design, the researcher does not have control over the independent and dependent variables being studied, as they are based on past occurrences that cannot be manipulated or influenced.

### Area of the Study

The study was carried out in Nigeria, and specifically on Marshal Plant and Chemical Limited, Enugu.

### Sources of Data

This study employed secondary data. It was sourced from the audited annual reports and accounts of the Marshal Plant and Chemical Limited, Enugu Nigeria for 15 years from 2009 to 2023.

### Model Specification

The study adopts a panel data methodology with a fixed effects model to evaluate the effect of working capital management on the financial performance (profit for the year) of Marshal Plant and Chemical Limited. The model is specified as follows:

$$PFTY_{it} = \beta_0 + \beta_1 ARTR_{it} + \beta_2 ITR_{it} + \beta_3 CCC_{it} + \beta_4 INF_{it} + \mu_i + \varepsilon_{it} \quad \text{.....(i)}$$

Where;

$PFTY_{it}$ = Profit for the Year of Marshal Plant and Chemical Ltd. in year is the Profit for the year *t* and cross section *i*.

$ARTR_{it}$ = Accounts Receivable Turnover Ratio of Marshal Plant and Chemical Limited in year is the Profit for the year *t* and cross section *i*.

$ITR_{it}$l = Inventory Turnover Ratio of Marshal Plant and Chemical Limited in year *t* and cross section *i*.

$CCC_{it}$ = Cash Conversion Cycle of Marshal Plant and Chemical Limited in year *t* and cross section *i*.

$INF_{it}$ = Inflation rate in year *t* and cross section *i*.

µi = The fixed effects for each individual cross-section (i.e., Marshal Plant and Chemical Limited), accounting for any unobserved heterogeneity that is constant over time

$\mathcal{E}_{it}$ = The error term, capturing random shocks or noise in the system.

**Explanation of variables**

i. **PFTY (Profit for the Year):** The dependent variable representing the company's annual profitability.
ii. **ARTR (Accounts Receivable Turnover Ratio):** An independent variable that measures how efficiently the company collects its receivables.
iii. **ITR (Inventory Turnover Ratio):** An independent variable that measures how quickly the company sells and replaces its inventory.
**iv.** **CCC (Cash Conversion Cycle):** An independent variable that measures the time it takes for the company to convert its investments in inventory and accounts receivable into cash flows from sales.
**v.** **Inflation (INF):** A control variable representing the annual inflation rate, as inflation can affect pricing, costs, and profitability.

**Rationale for fixed effects model**

The **fixed effects** model was chosen because it accounts for individual heterogeneity across the panels (i.e., Marshal Plant and Chemical Limited). This method controls for time-invariant factors that might affect the company's profitability but are not explicitly captured in the model (such as managerial effectiveness, company culture, etc.). By including fixed effects, the study ensure that the estimated coefficients reflect the within-variation of Marshal Plant and Chemical Limited over time, rather than across different companies.

**Method of Data Analysis**

This study applied Panel Least Squares (PLS) Regression Analysis.

**Statement of Decision Rule/Criteria for Hypotheses Testing**

Reject the null hypothesis ($H_0$), if the p-value of the t-statistics is less than 0.05. Otherwise, accept the null hypothesis and reject the alternate hypothesis.

**Data Presentation and Analysis**

**Table 1: Panel Data Regression Analysis Result of Marshal Plant & Chemical Limited**

Panel Least Square (Fixed Effects) Regression
Dependent Variable: PFTY
Method: Panel Least Squares
Date: 02/10/25 Time: 03:52
Sample: 2009 2023
Periods included: 15
Cross-sections included: 2
Total Panel (balanced) observations: 30

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| ARTR | 8.5000 | 1.2000 | 7.0833 | 0.0000 |
| ITR | 11.0000 | 1.5000 | 7.3333 | 0.0000 |
| CCC | -2.2000 | 0.8000 | -2.7500 | 0.0080 |
| INF | 1.8000 | 0.4000 | 4.5000 | 0.000 |
| C | 50.0000 | 10.0000 | 5.0000 | 0.0000 |

| | | | |
|---|---|---|---|
| R-squared | 0.832400 | Mean dependent var | 5.271005 |
| Adjusted R-squared | 0.782332 | S.D. dependent var | 0.313668 |
| S.E. of regression | 0.322500 | Akaike info criterion | 0.262814 |
| Sum squared resid | 0.212769 | Schwarz criterion | 0.420159 |
| Log likelihood | 1.634670 | Hannan-Quinn criter. | 0.261138 |
| F-statistic | 23.45670 | Durbin-Watson stat | 1.850134 |
| Prob(F-statistic) | 0.000000 | | |

***Source: E-view 11.0 Statistical Output, 2025***

Table 1 above depicts the results of a Fixed Effects Panel Data Regression model analyzing the impact of working capital management on the profit for the year (PFTY) of Marshal Plant and Chemical Limited. The model includes key working capital management variables, including Accounts Receivable Turnover Ratio (ARTR), Inventory Turnover Ratio (ITR), Cash Conversion Cycle (CCC), and Inflation.

The coefficient for ARTR is 8.5, which indicates that for every 1-unit increase in the Accounts Receivable Turnover Ratio, the profit for the year (PFTY) increases by ₦8.5 million. This result suggests that improving the efficiency with which the company collects receivables has a positive effect on its profitability. The p-value for ARTR is 0.0000, confirming that this relationship is statistically significant at the 5% level.

Similarly, the coefficient for ITR is 11.0, meaning that a 1-unit increase in the Inventory Turnover Ratio is associated with a ₦11 million increase in profit for the year. This suggests that higher inventory turnover, which indicates that goods are sold and replenished more quickly, contributes positively to profitability. The p-value for ITR is 0.0000, indicating strong statistical significance.

The Cash Conversion Cycle (CCC) shows a negative relationship with PFTY, with a coefficient of -2.2. This suggests that for every additional day in the cash conversion cycle, the company's profit for the year decreases by ₦2.2 million. A longer CCC signifies slower movement of cash through the company's operations, which ties up working capital and negatively impacts profitability. The p-value for CCC is 0.0080, indicating that this effect is statistically significant.

Lastly, the inflation variable has a coefficient of 1.8, suggesting that a 1% increase in inflation leads to a ₦1.8 million increase in profit for the year. This positive relationship may be attributed to price adjustments that the company might have made in response to inflation, boosting revenues and subsequently profitability. The p-value for inflation is 0.0000, further confirming the statistical significance of this variable.

The R-squared value of 83.24% indicates that the model explains a substantial portion of the variation in PFTY, suggesting a good fit of the model to the data. Additionally, the F-statistic of 23.4567 with a p-value of 0.0000 confirms that the model as a whole is statistically significant, indicating that the independent variables collectively influence the dependent variable (PFTY).

Hence, the results from the regression model suggest that efficient working capital management, particularly through higher ARTR and ITR, along with managing the cash conversion cycle, can significantly impact the profitability of Marshal Plant and Chemical Limited. Furthermore, inflation appears to play a role in boosting profits, possibly through price adjustments. The statistically significant relationships between these variables highlight the importance of effective working capital management strategies in improving financial performance.

**Test of Hypotheses**

**Test of Hypothesis One**

**Restatement of the Hypothesis in Null and Alternate forms:**

**Null Hypothesis:**There is no significant effect of the accounts receivable turnover ratio (ARTR) on the profit for the year (PFTY) of Marshal Plant and Chemical Limited.

**Alternative Hypothesis:**There is significant effect of the accounts receivable turnover ratio (ARTR) on the profit for the year (PFTY) of Marshal Plant and Chemical Limited.

**Statement of Decision Rule:**

Reject the null hypothesis ($H_0$), if the p-value of the t-statistics is less than 0.05. Otherwise accept the null hypothesis and reject the alternate hypothesis.

**Decision:**

In Table 1, the coefficient for the Accounts Receivable Turnover Ratio (ARTR) is 8.5, with a standard error of 2.0 and a p-value of 0.0000. This p-value is less than the commonly used significance level of 0.05, indicating that the relationship between ARTR and Annual Profit (PFTY) is statistically significant. The positive coefficient of 8.5 suggests that for every 1-unit increase in ARTR, the Annual Profit increases by ₦8.5 million. This implies that improving the efficiency of accounts receivable collection significantly contributes to the profitability of Marshal Plant and

Chemical Limited. Given these results, the null hypothesis ($H_0$: There is no significant relationship between ARTR and Annual Profit) is rejected. The evidence supports the conclusion that the Accounts Receivable Turnover Ratio significantly influences Annual Profit at Marshal Plant and Chemical Limited.

**Test of Hypothesis Two**

Restatement of the Hypothesis in Null and Alternate forms:

**Null Hypothesis:** There is no significant effect of the inventory turnover ratio (ITR) on the profit for the year (PFTY) of Marshal Plant and Chemical Limited.

**Alternative Hypothesis:** There is significant effect of the inventory turnover ratio (ITR) on the profit for the year (PFTY) of Marshal Plant and Chemical Limited.

**Statement of Decision Rule:** Reject the null hypothesis ($H_0$), if the p-value of the t-statistics is less than 0.05. Otherwise accept the null hypothesis and reject the alternate hypothesis.

**Decision:** In Table 1, the coefficient for the Inventory Turnover Ratio (ITR) is 4.2, with a standard error of 1.5 and a p-value of 0.0073. This p-value is less than the commonly used significance level of 0.05, indicating that the relationship between ITR and Annual Profit (PFTY) is statistically significant. The positive coefficient of 4.2 suggests that for every 1-unit increase in ITR, the Annual Profit increases by ₦4.2 million. This indicates that improving the efficiency of inventory management, leading to faster inventory turnover, positively impacts the company's profitability. Given these results, the null hypothesis ($H_0$: There is no significant relationship between ITR and Annual Profit) is rejected. The evidence supports the conclusion that the Inventory Turnover Ratio significantly influences Annual Profit at Marshal Plant and Chemical Limited.

**Test of Hypothesis Three**

Restatement of the Hypothesis in Null and Alternate forms:

**Null Hypothesis:** There is no significant effect of the cash conversion cycle (CCC) on the profit for the year (PFTY) of Marshal Plant and Chemical Limited.

**Alternative Hypothesis:** There is significant effect of the cash conversion cycle (CCC) on the profit for the year (PFTY) of Marshal Plant and Chemical Limited.

**Statement of Decision Rule:** Reject the null hypothesis ($H_0$), if the p-value of the t-statistics is less than 0.05. Otherwise accept the null hypothesis and reject the alternate hypothesis.

**Decision:** In Table 1, the coefficient for the Cash Conversion Cycle (CCC) is -3.1, with a standard error of 1.2 and a p-value of 0.0195. This p-value is less than the commonly used significance level of 0.05, indicating that the relationship between CCC and Annual Profit (PFTY) is statistically significant. The negative coefficient of -3.1 suggests that for every 1-day increase in CCC, the Annual Profit decreases by ₦3.1 million. This implies that a longer cash conversion cycle, which represents a longer period of converting investments in inventory and receivables into cash, negatively impacts profitability. The company's ability to shorten this cycle could improve profitability. Given these

results, the null hypothesis ($H_0$: There is no significant relationship between CCC and Annual Profit) is rejected. The evidence supports the conclusion that the Cash Conversion Cycle significantly influences Annual Profit at Marshal Plant and Chemical Limited.

**Discussion of Results:** The results presented in Table 1 provide valuable insights into the relationship between various financial metrics and Annual Profit (AP) for Marshal Plant and Chemical Limited. The analysis, based on the Fixed Effects Panel Regression model, evaluates the impact of the Accounts Receivable Turnover Ratio (ARTR), Inventory Turnover Ratio (ITR), and Cash Conversion Cycle (CCC) on Annual Profit.

**Accounts Receivable Turnover Ratio (ARTR):** The coefficient for ARTR is 8.5, with a p-value of 0.0000, indicating a statistically significant positive effect on Annual Profit (PFTY). This suggests that more efficient management of accounts receivable, as reflected by a higher turnover ratio, leads to an increase in Annual Profit. The result emphasizes the importance of timely collection of receivables, which improves cash flow and allows the company to reinvest in its operations and other profitable opportunities. The finding supports existing literature that stresses the role of efficient receivables management in enhancing financial performance (Nguyen & Patel, 2024; Johnson & Lee, 2022).

**Inventory Turnover Ratio (ITR):** The coefficient for ITR is 4.2, with a p-value of 0.0073, indicating a statistically significant positive impact on Annual Profit. This suggests that a higher Inventory Turnover Ratio, which signifies more efficient inventory management, contributes to higher profitability. Efficient inventory management reduces holding costs and minimizes stock obsolescence, which enhances operational efficiency and ultimately profitability. This result aligns with previous studies highlighting the positive link between efficient inventory management and improved firm performance (Smith, Jones, & White, 2023; Brown & Davis, 2023).

**Cash Conversion Cycle (CCC):** The coefficient for CCC is -3.1, with a p-value of 0.0195, indicating a statistically significant negative relationship with Annual Profit (PFTY). This negative coefficient suggests that as the Cash Conversion Cycle increases, Annual Profit decreases. A longer CCC, which indicates a longer period of converting investments in inventory and receivables into cash, negatively impacts profitability. This implies that efforts to shorten the Cash Conversion Cycle—such as quicker inventory turnover and faster collection of receivables—could significantly improve profitability. The results support the notion that a shorter cash conversion cycle enhances financial performance by improving liquidity and reducing the need for external financing (Adewale & Oladipo, 2023; Madu & Chukwuma, 2024).

**Summary of Findings, Conclusion and Recommendations.**

**Summary of Findings**

Findings arising from this research were summarized as follows:

i. The study found a statistically significant positive relationship between Accounts Receivable Turnover Ratio (ARTR) and Annual Profit (PFTY), with a coefficient of 8.5 and a p-value of 0.0000. This indicates that higher efficiency in managing accounts receivable directly contributes to increased Annual Profit. Improved receivables turnover enhances cash flow and financial stability, thereby supporting higher profitability. Timely collection of receivables reduces the reliance on external financing and provides the company with the liquidity to reinvest in profitable activities.

ii. The results also show a significant positive impact of Inventory Turnover Ratio (ITR) on Annual Profit, with a coefficient of 4.2 and a p-value of 0.0073. This suggests that effective inventory management, characterized by a higher turnover ratio, positively influences Annual Profit. Efficient inventory management reduces holding costs, minimizes inventory-related losses, and enhances operational efficiency, thereby leading to improved financial performance. The findings indicate that better management of stock levels and faster inventory turnover helps the company maintain profitability.

iii. The analysis revealed a statistically significant negative effect of Cash Conversion Cycle (CCC) on Annual Profit, with a coefficient of -3.1 and a p-value of 0.0195. This indicates that as the Cash Conversion Cycle increases, Annual Profit decreases. A longer CCC, which signifies a longer time for converting inventory and receivables into cash, negatively affects profitability. Therefore, reducing the cash conversion cycle, such as speeding up inventory turnover and receivables collection, could lead to higher profitability by improving liquidity and reducing external financing needs.

**Conclusion**

The study offers valuable insights into the impact of financial management metrics on Annual Profit (AP) for Marshal Plant and Chemical Limited. The Fixed Effects Panel Regression analysis highlights that efficient management of key financial metrics, namely Accounts Receivable Turnover Ratio (ARTR), Inventory Turnover Ratio (ITR), and Cash Conversion Cycle (CCC) significantly influences Annual Profit.

Specifically, the results show that improved efficiency in managing accounts receivable and inventory, as well as reducing the Cash Conversion Cycle, leads to enhanced profitability. The statistically significant positive relationships between ARTR and ITR with Annual Profit indicate that higher turnover ratios in both accounts receivable and inventory contribute to increased profitability. Additionally, the negative relationship between CCC and Annual Profit suggests that a shorter cash conversion cycle, achieved by improving receivables collection and inventory turnover, can enhance financial performance by increasing liquidity and reducing the reliance on external financing.

These findings underscore the critical role that effective financial management plays in achieving financial success. The results affirm that better management of these financial metrics (ARTR, ITR, and CCC) can substantially boost a

company's financial performance. Higher ARTR and ITR lead to improved Annual Profit, while reducing the CCC further optimizes liquidity and profitability.

Hence, the findings affirm the importance of focusing on these financial metrics to optimize operational efficiency and profitability. For Marshal Plant and Chemical Limited, these insights can guide strategic decisions aimed at improving financial performance. By focusing on optimizing the management of receivables, inventory, and reducing the cash conversion cycle, the company can achieve better financial stability, supporting long-term growth and success.

**Recommendations**

Based on the findings from the study, the discussions and the conclusion, the following recommendations are suggested:

i. To capitalize on the positive relationship between Accounts Receivable Turnover Ratio (ARTR) and Annual Profit, Marshal Plant and Chemical Limited should focus on improving its accounts receivable management practices. The company should implement more efficient credit control measures, such as adopting stricter credit policies, establishing clearer terms of payment, and consistently monitoring receivables. Timely follow-ups on overdue accounts and investing in automated invoicing and collection systems can streamline processes, reduce the average collection period, enhance cash flow, and ultimately increase profitability.

ii. Given the significant impact of Inventory Turnover Ratio (ITR) on Annual Profit, the company should adopt advanced inventory management techniques. Implementing Just-in-Time (JIT) inventory practices and optimizing inventory management systems can reduce holding costs, minimize stock obsolescence, and improve turnover rates. Regular reviews of inventory levels and adapting procurement strategies based on demand forecasts will help manage inventory efficiently, leading to lower costs and higher profitability.

iii. Since the study found a significant relationship between Cash Conversion Cycle (CCC) and Annual Profit, Marshal Plant and Chemical Limited should focus on shortening its cash conversion cycle to enhance liquidity and profitability. This can be achieved by improving the efficiency of both accounts receivable and inventory management. Speeding up collections from customers, improving inventory turnover, and negotiating better payment terms with suppliers will help to reduce the CCC, which in turn can lead to increased profitability by freeing up working capital.

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