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WORKING CAPITAL MANAGEMENT STRATEGIES OF NIGERIAN MANUFACTURING INDUSTRIES AND FIRMS VALUE

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Abstract

This research explores the capital management strategies employed by Nigerian manufacturing industries and their impact on firm value, as measured by Earnings per Share (EPS). Employing an ex post facto research design, the study focuses on a population of 25 industrial goods industries, selecting a sample of 9 quoted manufacturing firms. The independent variables encompass various working capital management strategies, including accounts receivable management, accounts payable management, inventory management, cash conversion cycle, cash conversion efficiency, current assets to total assets ratio, and current liabilities to total assets ratio. The dependent variable is firm value, proxied by EPS. Results reveal both short-term and long-term effects of working capital management on EPS. The long- run model demonstrates significant negative relationships between accounts receivable management (ARM) and EPS, suggesting that efficient management of accounts receivables has a significant impact on financial performance. Conversely, accounts payable management (APM) exhibits a positive but non-significant effect. Inventory management (INVM) and cash conversion cycle (CCC) are positively related to EPS, with CCC and cash conversion efficiency (CCE) having significant effects. In the short run, the error correction model (ECM) indicates a negative and significant impact of deviations in accounts receivable management and cash conversion cycle on EPS. The study recommends among others that organizations focus on enhancing short-term corrective measures, such as agile and responsive strategies in accounts receivables, to ensure immediate and efficient impacts on financial performance.

Keywords: *Working Capital Management, Earnings per Share, Firm Value, Manufacturing Firms*

INTRODUCTION

Working Capital Management is a simple and straight forward concept of ensuring the ability of the firm to fund the difference between the short-term assets and short-term liabilities. It deals with the administration of a firm's current assets and current liabilities (Vartak & Hotchandani, 2019; Al-Mawsheki, Ahmad & Nordin, 2019). Working capital management ensures that a company has sufficient cash flows to meet its short-term debt obligations and operating expenses (Mekonnen, 2011). Working capital management is a very important component of corporate finance because it directly affects liquidity and profitability of a company (Anand & Gupta, 2013). Working Capital Managementis important for many reasons. The current assets of a typical manufacturing firm account for over half of its total assets.Thus, working capital represents a significant investment in the manufacturing firms. Excessive levels of current assets can easily result in a firm's realization of a substandard return on investment (Azam & Haider, 2011).

Management of working capital which aims at maintaining an optimal balance between each of the working capital components, that is, cash, account receivables, inventory and account payables is a fundamental part of the overall corporate strategy to create value and is an important source of competitive advantage in businesses (Deloof, 2003). Keeping an optimal balance among each of the working capital components is the main objective of working capital management. Business success heavily depends on the ability of the financial managers to effectively manage receivables, inventory, and payables (Filbeck & Krueger, 2005). A well-calculated and employed working capital management is anticipated to add positively to the firm's performance. Holding excess amounts of working capital could cause a decline in the profitability of a business, whereas less working capital could result in an inability to cover a firm's short-term expenses and might be a sign of impending insolvency. This study, therefore, is undertaken to examine impact of working capital management on the performance of manufacturing industries in Nigeria. By the time the study is completed the researchers would be in a better way to ascertain the true position of affairs.

Statement of problem

Efficient working capital management involves planning and controlling current assets and current liabilities in a manner that eliminates the risk of inability to meet due short-term obligations. Nigerian business managers had been reported as embodied with some inadequacies among which are poor debts management resulting to bad debts, poor inventing management leading high inventory costs; all of which affect the firm performance (Gao& Wang, 2017). Again, high profit-making is not necessarily an indication of effective management of the firm's working capital as a firm could just have large assets and high profit base but runs the risk of liquidity if such assets cannot readily be turned into cash. Lackof ready cash causes firms to fall short in meeting financial obligations. Such firms may run into debts that could affect its performance in the long run, especially when it results to loss of credibility that would affects the smooth-running operations of the business. A manager that neglects the firm's operating cycle may end up with longer account receivables time frame and shorter account payable time frame, which is aspect of ineffective working capital management strategy.

Objectives of the study

The main objective of the study is to examine the effect of working capital management strategies on firm values ofmanufacturing firms in Nigeria. The specific objectives are to:

i. Examine the effect of account receivable management on firm values of manufacturing firms in Nigeria.
ii. Determine the effect of account payable management on firm of manufacturing firms in Nigeria.
iii. Assess the effect of inventory management on firm of manufacturing firms in Nigeria.
iv. Examine the effect of cash conversion cycle on firm of manufacturing firms in Nigeria.
v. Examine the effect of cash conversion efficiency on firm of manufacturing firms in Nigeria.

Hypotheses

The study was guided by the following null hypotheses:

i. Account receivable management has no significant effect on firm of manufacturing firms.
ii. Account payable management has no significant effect on firm of manufacturing firms.
iii. Inventory management has no significant effect on firm of manufacturing firms.
iv. Cash conversion cycle has no significant effect on firm of manufacturing firms.
v. Cash conversion efficiency has no significant effect on firm of manufacturing firms.

2.0 LITERATURE REVIEW

Working capital

Working capital is a fundamental financial metric that represents the operational liquidity and short-term financial health of a business. It is the difference between a company's current assets and current liabilities, reflecting the resources available to cover day-to-day operational expenses and short-term obligations. Current assets typically include cash, accounts receivable, and inventory, while current liabilities encompass accounts payable and short-term debts. Maintaining an optimal level of working capital is essential for ensuring smooth business operations, meeting short-term financial obligations, and seizing

strategic opportunities (Eya, 2016).

Working capital management

Working capital management constitutes management accounting strategy that ordinarily concentrates on maintaining efficient levels of current assets and liabilities to ensure adequate cash flow in order to meet its pressing financial obligations (Akoto, Awunyo-Vitor, and Angmor, 2013). Corroborating evidence by Rahman, Iqbal and Nadeem (2019), indicates that working capital management forms a crucial part of financial management which contributes significantly to a firm's wealth creation since it forms the basis of organizational profitability and liquidity. Thus, working capital management has to do with the establishment and application of working capital policy to day-to-day operations. While the definition of working capital remains same among scholars, effective management of firms' working capital is what put firms apart.

Working capital management strategies

The common working capital management strategies are the average collection period, the inventory turnover average payment period and cash conversion cycle (Vartak & Hotchandani, 2019). Yegon, Kiprono and Willy (2014) introduced the Net Trading Cycle as another working capital management strategy. Another nomenclature for the Net Trade Cycle was used by Simon, Sawandi and Abdul-Hamid (2018) as the Cash conversion efficiency (CCE). On the strength of this,the present study appreciate five working capital management strategies to include Accounts receivable Management, Accounts payable management, Inventory management, Cash conversion cycle, Cash conversion efficiency (also known as the Net trade cycle).

Accounts receivable management

Accounts Receivable Management involves the time it takes for customers to settle debts. The metric, expressed as the debt collection period, is calculated by dividing average accounts receivable by net sales and multiplying the result by the average days in a year. Significantly, shorter collection periods are associated with enhanced financial performance. Consequently, strategic focus should center on devising approaches to shorten debtor collection periods, thereby improving both liquidity and overall profitability (Ling, Ali & Ming,2019).

Accounts payable management
Accounts Payable Management pertains to short-term commitments for purchases or services not yet settled. The metric, known as the average payment period, measures the days a company takes to pay its creditors. It holds significance in influencing working capital, where an increase improves overallworking capital. In strategic terms, integrating profitability metrics into management strategies is crucial, and careful consideration of credit terms from suppliers is advised (Kusuma & Bachtiar, 2018).

Inventory management
Inventory Management is characterized by the frequency of selling the entire inventory during an accounting period. The metric, the inventory turnover ratio, serves as an indicator of effective inventory management. Significantly, a low turnover ratio may suggest overstocking, while a high ratio indicates efficient management. Strategically, the focus should be on optimizing the inventory holding strategy based on sales and receivables, considering factors such as holding and opportunity costs (Nobanee, *et al.*, 2011).

Cash conversion cycle
The Cash Conversion Cycle represents the time between a firm's payment forpayables and collections for receivables. Calculated as the sum of inventory days, accounts receivable days, and the subtraction of accounts payable days, a shorter cycle is associated with improved liquidity and profitability. The strategic focus here involves balancing liberal credit policies for profitability with the imperative need for liquidity (Vartak & Hotchandani, 2019).

Cash conversion efficiency
Cash Conversion Efficiency is synonymous with the net trade cycle and emphasizes the cash flow generated from operating activities related to sales. A high efficiency in cash conversion signifies effective cash collection. From a strategic perspective, the aim is to achieve higher cash conversion efficiency, ensuring liquidity for day-to-day operations and aligning with the critical principle that "cash is king." (IGI Global, 2020)

Firm performancefirm value
Firm performance evaluates the effectiveness and efficiency of a company in achieving its objectives and delivering value to stakeholders. It encompasses financial metrics, market share, innovation, and operational efficiency. A robust assessment of firm performance provides insights into competitiveness, sustainability, and overall success in the businessenvironment. Put succinctly, Tarek & Rafik (2020), posited two main objectives of financial management as profit and wealth maximization. They assert that sound management of working capital components contributes to the achievement of both objectives. This study thus anchors firm performance on value maximization. The profitability indicator is a market-based firm performance indicator measured as Earnings per Share (EPS) (Ling *et al.*, 2019).

The value of the firm is measured by Earnings per Share (EPS). The EPS ratio equals the earnings after tax (EAT) of a company divided by the total number of shares traded. Earnings after tax (EAT) refers to the measure of a company's netprofits (Hayes, 2020). In other words, it is calculated by subtracting all expenses and income taxes from the revenue the business has earned. Earnings per share (EPS) is calculated as a company's profit divided by the outstanding shares of common stock. Earnings per share indicates how much money a company makes for each share of its stock. A higherEPS indicates greater value because investors will pay more for a company's shares if they think the company has higher profits relative to its share price (Hayes, 2020).

Theoretical framework asset profitability theory
Asset profitability theory by Sathamoorthi (2002), stated that increase in current asset to total assets ratio has a negative effect on firms' profitability, while on the other hand, increase in current liabilities to total liabilities ratios has a positive effect on profitability of firms. This theory notes that decrease in current asset to total assets ratio as well as increase in the ratio of current liabilities to total liabilities ratios, when considered independently, lead to an increased profitability coupled with a corresponding increase in risk. Increase in the ratio of current assets to total assets decline in profitability because it is assumed that (i) current assets are less profitable than fixed assets; and (ii) short-term funds are less expensive than long-term funds. Decrease in the ratio of current assets to total assets will result in an increase in profitability as well as risk. The increase in profitability will primarily be due to the corresponding increase in fixed assets which are likely to generate higher returns because corresponding increase in fixed assets which are likely to generate higher returns (Sathamoorthi, 2002).

Transaction theory
The Transaction Cost Theory (TCT) was propagated in the works of Coase (1937) and Williamson (1985, 1991). The transaction costs are the costs involved in running the economic system. Coase (1937) suggests that there are always costs for carrying out market transactions. Therefore, a firm would prefer transactions to be organised within the firm if the cost would be less than the cost of carrying out the transaction in the market. However, as the additional costs of

transactions within the firm exceed the cost of carrying out the transaction through the market, firms attempt to reduce transaction costs by vertical integration (Williamson, 1991). Therefore, the rationale behind the transaction cost theory is that market costs are usually too high for firms to overcome individually. This leads to the creation of linkages for small firms (Thorelli, 1986).From a transaction theory perspective, a firm needs to consider two main costs, market transaction costs and control costs, as their part of internationalization process (Williamson, 1985; Hennart, 1989). These costs occuras the result of environmental and behavioral uncertainties, opportunism, and asset specificity(Rindfleisch&Heide, 1997). Rindfleisch and Heide (1997)states both environmental and behavioral uncertainties refer to the market changes that is unpredictable together with the uncertainty of possible firm action of reaction. The theory's central claim is that transactions will be handled in such a way as to minimize the costs involved in carrying them out.

Moderate approach

A middle ground between the conservative and aggressive approaches, moderate approaches of working capital management seek to balance risk and efficiency. They aim to maintain a reasonable level of working capital while also exploring opportunities for growth and investment. This approach requires careful monitoring of cash flow patterns and aproactive stance toward adjusting strategies as needed. This approach matches assets and liabilities to maturities (EduPristine, 2018). Basically, a company uses long term sources to finance fixed assets and permanent current assetsand short-term financing to finance temporary current assets.Firms that adopt the matching approach maintains a balance between stocking essential products and avoiding excess inventory. They maintain aregular receivables collection strategy, considering both cash flow and customer relations; and manages payables strategically, by optimising supplier relationships while honouring payment commitments. The matching or moderate approach posits that firms should allocates a portion of its capital to explore new product lines and store expansion opportunities; and consistently monitorsits cash flow patterns and adjusts strategies accordingly.

Empirical review

The empirical reviews carried out on working capital management and firm performance nexus cut across economies of the developed and developing countries from all continents, especially Asia, Africa with bulk of the studies from researcher's country Nigeria. Several empirical studies were reviewed covering over ten countries of the world from Malaysia (Al-Mawsheki, *et al.*,2019), Indonesia (Nastiti *et al* 2019), China (Le *et al.*,2018), Pakistan (Wang, *et al* 2020), India (Vartak & Hotchandani, 2019), Vietnam (Nguyen, *et al* 2020), South Africa (Mabandla & Makoni, 2019),Ghana (Yakubu *et al.*,2017), Egypt (Tarek & Rafik, 2020), Kenya (Yegon, *et al* 2014), and Nigeria (Abubakar *et al.*,2020).

The empirical reviews identify proxies of working capital management strategies so far adopted in studies. These variables and examples of studies that employed them are: Accounts Receivable Management (Bagh, *et al* 2016; Simon, *et al* 2018; Vartak & Hotchandani, 2019), Accounts Payable Management (Bagh, *et al* 2016; Simon, *et al* 2018; Vartak& Hotchandani, 2019), Inventory Management (Bagh, *et al* 2016; Simon, *et al* 2018; Vartak & Hotchandani, 2019), CashConversion Cycle (Azam & Haider, 2011;Yegon, *et al* 2014;Yakubu, *et al* 2017; Simon, *et al* 2018; Kusuma & Bachtiar, 2018; Vartak & Hotchandani, 2019; Al-Mawsheki, *et al* 2019), Cash Conversion Efficiency (Kaur & Singh, 2013; Simon, *et al*, 2018), Net Trade Cycle (Yegon, *et al* 2014; Hoang, 2015; Madugba & Ogbonnaya, 2016; Vijayakumaran, 2019; Wang, *et al* 2020), and Net Working Capital (Kusuma & Bachtiar, 2018; Etale & Oweibi 2020). The use of cash conversion efficiency (CCE) and Net Trade Cycle (NTC) in the literature are interchangeable. Both variables are the same in computation and thus in meaning. It is the CCC expressed as a proportion of net sales. Moreover, most studies that employed CCC equally included collection (receivables), payment and inventory since they are the components ofthe CCC computation. Studies that adopted the net working capital strategies employed it as single variable of WCM.

The popular opinion of researchers on is that efficient working capital management strategies is apt for enhanced firm performance across the globe. These are the studies which showed a significant relationship between working capital management strategies and firm performance indicators. These studies include those of Wang *et al.,* (2020) and Kajola *et al.*, (2014). They posit that working capital management has negative effect on firm performance. Others found a positiveeffect which suggests that working capital management portends adverse effect on firm performance, as increasing working capital variables means excess use of short-term funds as against reduced usage. Amongst these studies are Khalid *et al.,* (2018) which averred working capital management has positive effects on firm performance indicators. However, a number of studies found a divergent and mixed views where those variables of working capital management strategies tend to disagree on direction and strength of effects on various measures of firm performance like Return on Asset (ROA), Return on Equity (ROE), Profit After Tax (PAT), Firm value (Tobin's Q), or Earnings Per Share (EPS). These studies include Simon, *et al.*,(2019), Vartak and Hotchandani (2019), Ling, *et al* (2019), Kasozi (2017) and Tariq*et al* (2013). Ling, *et al* (2019)posit that such divergences in results can be attributed to some factors such as variations inbusiness environments and different methodology for the various studies.

These inconsistencies in extant empirical literature portents a research gap. Most of the previous studies done in Nigeria have used time frame below 2017 which suggests impending moribund of the existing studies. This is in spite of the fact that some of them are very recent they still used a relatively old data frame ending in 2014 (Abdulazeez, *et al* 2018; Uguru, *et al* 2018), in 2015, (Simon, *et al* 2018), in 2016 (Osuma & Ikpefan, 2018), and in 2017 (Akinleye &Adeboboye, 2019). The only very current studies in Nigeria like Etale and Oweibi (2020) used only one firm (Dangote Sugar) to x-ray WCM effects across quoted firms. It is also noteworthy that most of the studies in Nigeria, unlike their foreign counterparts, could not disintegrate the working capital management strategies into separate models that would enable managers and strategic policy corporate finance experts to appreciate the role of each strategy on firm performance. The present study becomes apt to explain working capital management strategies and performance nexus across quoted firms in Nigeria with particular interest in the manufacturing sector, as the largest and stronghold of Nigerian economy.

METHODOLOGY

Research design

The ex-post-facto research design was adopted for the study. The ex-post facto is suitable for estimating the causal relationship between WCM strategies and firm performance. The ex-post facto design is the most suitable substitute for true experimental research to test hypotheses about cause-and-effect relationships in situations in which that event had taken place and the data already available from reliable source (Salkind, 2010).

Population of study

This study's focus was on the Nigeria Exchange Group's quoted firms' 25 industrial goods industries as of October 2021. The study excluded Nigerian industries that might not be directly related to manufacturing issues, such as conglomerates, agriculture, healthcare, ICT, and natural resources. The manufacturing companies—oil and gas, real estate and construction, services, financial services, and utilities—have not been taken into account. The information regarding the number of listed firms in Nigeria is displayed in Table 1, with a particular emphasis on enterprises involved inmanufacturing.

Table 1: Listed of quoted firms in Nigeria.

SN	Sectors quoted on NSE	Total Number of Companies*	Selected as Manufacturing sector
1	Industrial Goods	25	25
	Total	25	25

Sources: Author's computation, *Extracts from the list of quoted firms in Nigeria

Sample size and sampling technique

A sample of 9 quoted manufacturing firms are selected for the study. Criteria for inclusion of these firms into the sampleare as follows:

1. They must be firms in among the firms in the consumers goods and industrial goods sectors, quoted on the Nigerian Exchange Group.
2. They must have been rendering annual financial reports to the public from 2000 to 2020.
3. The data for the computation of variables of the study must be available in financial reports of the selectedfirms.

The sample formed about 17% of the quoted manufacturing firms in Nigeria. The sample size is justified by the claimthat a good sample covers at least 10%-30% of the representative population (Mugenda & Mugenda, 2003).

Sources for data collection

The data was collected from secondary sources. The main source of all the data will be from the Financial Statement and Annual Reports of the selected firms. A period of Twenty (20) years was used spanning 2000 to 2020, being the most current period for data availability. The data set is a panel framework consisting a set of time series (2000 to 2020) of firms selected from the population of manufacturing firms quoted on the Nigeria Exchange Group.

Description of variables and measurement

Table 2: Acronyms and the Measurement of Variables

SN	Variables	Acronym	Measurement	Proxy
2	Earnings per share	EPS	Earnings after tax /total shares traded	Dependent
3	Accounts Receivable management	ARM	[(Account receivable/Sales) x 365]	Independent
4	Accounts payable management	APM	[(Account payable/Purchases) x 365]	Independent
5	Inventory management	INVM	[(Inventory/cost of sales) x 365]	Independent
6	Cash conversion cycle	CCC	[ARM + INVM – APM].	Independent
7	Cash conversion efficiency	CCE	[Cash-flow from operations/sales]	Independent
9	Current Assets to Total Assets Ratio	CATAR	Current assets to Total assets	Control
10	Current Liabilities to Total Assets Ratio	CLTAR	Current Liabilities / Total assets	Control

Source: Extracts from Vartak and Hotchandani, (2019), Ling, *et al* (2019), Simon, *et al* (2018); and Yegon, *et al* (2014)

Model specification

The work of Akinleye and Adeboboye (2019) is adapted for this model. The work employed EPS as dependent variable and regressed Average Collection Period (ACP), average payment period (APP) as the independent variables and two control variables being Asset Tangibility, Firm Size. The model is as follows:

EPS = *f* (ACP, APP, AT, FS)

Where,
ACP = Average Collection PeriodAPP = Average Payment Period AT = Asset Tangibility
FS = Firm Size

The current model is modified to factor in all the five WCM variables and controlled for firms investment and financing policies using Current Assets to Total Assets Ratio (CATAR) and Current Liabilities to Total Assets Ratio (CLTAR) respectively. The model can be written as

EPS = f (ARM, APM, INVM, CCC, CCE, CATAR, CLTAR)
The function can be written as equation as follows:
$EPS_{it} = \beta_0 + \beta_1 ARM_{it} + \beta_2 APM_{it} + \beta_3 INVM_{it} + \beta_4 CCC_{it} + \beta_5 CCE_{it} + \beta_6 CATAR_{it} + \beta_7 CLTAR_{it} + \mu_{it}$ Where,
EPS = Earnings per share
ARM = Accounts Receivable ManagementAPM = Accounts Payable Management INVM = Inventory Management
CCC = Cash Conversion Cycle, andCCE = Cash Conversion Efficiency,
CATAR = firm investment policy captured as Current Assets to Total Assets Ratio CLTAR = Firm financing policy represented with Current Liabilities to Total Assets Ratioμ = Random error term
β_0 = Constant
i = the notation to present number of firms in the modelt = the time period of the time series
β_{1-7}, are the coefficients of the regression equation. The acronyms are as defined in Table 2.

A priori Expectations

Table 3: A priori expectations of the explanatory variables on firm performance

SN	Variables	Acronym	EPS
1	Accounts Receivable management	ARM	-
2	Accounts payable management	APM	+
3	Inventory management	INVM	-
4	Cash conversion cycle	CCC	-
5	Cash conversion efficiency	CCE	-
6	Current Assets to Total Assets Ratio	CATAR	-
7	Current Liabilities to Total Assets Ratio	CLTAR	-

Sources: Researchers conception and extract from reviewed literature

Method of data analyses

In this research, the Auto-regressive Distributive Lag (ARDL) technique served as the primary method for data analysis, specifically employed to investigate the impact of working capital management on corporate performance in Nigerian manufacturing firms using a Structural Vector Auto-regression (SVAR) Model. To establish the stationarity of variables crucial for Ordinary Least Squares (OLS) estimation validity, the Levin, Lin & Chu (LLC) specification for unit root test in panel data was utilized. This approach considered more suitable for panel data compared to other standard tests like ADF, PP, and KPSS, played a pivotal role in ensuring the reliability of subsequent analyses.

The co-integration test employed the ARDL bound to assess the co-integration between non-stationary variables, choosing this approach over traditional Johansen co-integration due to its ability to handle different orders of integration in time series data. The Granger Causality Test was then utilized to evaluate the predictive power of variables, focusing on whether corporate performance is Granger caused by working capital management components based on the aid in prediction or the statistical significance of lagged coefficients. For situations where the co-integration test revealed multiple co-integrating vectors, the ARDL Error Correction Model was applied. Finally, the interpretation of regression results involved key statistical metrics such as Adjusted R-Square, F-Statistic, and the Durbin Watson test to explain the nature of the relationship between dependent and independent variables, measure model fit, and identify potential autocorrelation in the model.

4.0 RESULTS AND DISCUSSION

Data presentation

The variables for the study is presented in Table 4. The study variables are Accounts Receivable management (ARM), Accounts payable management (APM), Inventory management (INVM), Cash conversion cycle (CCC), Cash conversion efficiency (CCE), Current Assets to Total Assets Ratio (CATAR), Current Liabilities to Total Assets Ratio (CLTAR).

ANALYSIS OF DESCRIPTIVE STATISTICS

The descriptive statistics including the mean, standard deviation, Maximum, minimum, Skewness and Kurtosis, as wellas the Jacque Bera for the individual variables analyzed. They are shown on Table 4, as well as, in a graphical format on Figure 1.

Table 4: Summary of descriptive variables in the study

	EPS	ARM	APM	INVM	CCC	CCE	CATAR	CLTAR
Mean	29.55112	21.67714	61.73410	38.41687	13.66910	8.887447	0.606631	0.631011
Median	6.555000	17.65000	45.00000	22.11000	10.93000	7.170000	0.560000	0.430000
Maximum	570.0000	74.14000	223.4300	750.0100	691.6900	46.04000	1.980000	23.00000
Minimum	-574.000	0.300000	0.080000	1.160000	-101.840	-19.0500	0.230000	0.011000
Std. Dev.	97.67607	17.81781	51.75618	65.96970	74.68610	8.396064	0.298555	2.325568
Skewness	1.871201	0.899850	1.327547	7.528018	4.486375	1.598911	2.494612	9.489689
Kurtosis	22.95218	2.931953	4.034759	75.43028	38.25086	8.290486	10.37800	91.54775
Jarque-Bera	3228.078	25.54296	63.60865	43098.53	10419.67	299.3533	618.0918	64582.25
Prob	0.000000	0.000003	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Sum	5555.610	4096.980	11606.01	7260.789	2583.460	1670.840	113.4400	119.2610
Observations	188	189	188	189	189	188	187	189

Source: E-views Estimation

The descriptive statistics of the variables are shown on Table 4. The mean values show the average distribution of the variables.

Variables with low standard deviation suggest that the mean clustered around the mean while high standard deviation implies wide variation from the mean. The variables for ARM, APM, CCE, and CATAR display standard deviation lower than the mean values. However, EPS, INVM, and CLTAR, have mean values greater than the standard deviation. This is suggestive that variables for earnings per share (EPS), INVM, and CLTAR, have wide variation that may implies lack of normal distribution. However, other variables appear to cluster around the mean and suggest normal distribution of the variables.
Nonetheless, the Jarque-Bera statistics examine the normality of the individual variables of the study. The null hypothesis is that the variables are normally distributed. Thus, we reject the hypotheses for variables with p. value less than 0.05 level of significance, otherwise we cannot reject. The p-values for all the variables are less than 0.05, thus we reject the null hypothesis and conclude that most of the variables are not normally distributed. This implies that the variables in the models do not follow similar trends in all the firms included in this study.

Unit root analysis
The unit root analysis was performed to determine the stationarity of the variables. The Levin, Lin & Chu (LLC) which a panel unit root technique that assumes common unit root process was employed. The decision rule is to reject stationarityif the computed statistics is less than 5% critical value, otherwise, accept stationarity when computed is greater than 5% criteria value.

Table 5: Summary of Unit Root Test for Stationarity

Variables	At Level 1(0)	At First Difference 1(1)	Order of Integration
Earnings Per Share (EPS)	-2.7380 (0.0031)		1(0)
Account Receivables Managemen (ARM)	t -06442 (0.2597)	3.7570 0.0001)	1(I)
Account Payable Management (APM)	-0.6442 (0.2597)	-3.7570 (0.0001)	1(I)
Inventory Management (INVM)	0.9760 (0.8355)	-4.7958 (0.0000)	1(I)
Cash Conversion Cycle (CCC)	.9488 .0016)		1(0)
Cash Conversion Efficiency (CCE)	.7501 .2266)	-7.09322 (0.0000)	1(1)
CATAR	5.7407 0.0000)		1(0)
CLTAR	528 000)		1(0)

Sources: Extracts E-views Estimation on Appendix 3

The results on Table 5 show that there is a mixture of stationarity levels among the variables. EPS, CCC, CATAR, and CLTAR, are stationary at level 1(0), while other variables including ARM, APM, INVM, and CCE are not stationary at level 1(0) and become stationary in their first differences 1(1). The result of the unit root analysis shows that at least one variable will be stationary at 1(0) and 1(1) in each of the models for the study. Thus, the models for the study are said to have a combination of both 1(0) and 1(1).

Model estimation
The results of the model's estimation were based on panel ARDL technique that captured both the long and short runnature of the data of the study.

Estimation of effect of working capital management strategies on firmsprofitability

Table 6: Panel ARDL Result of Working Capital Management on Earnings per Share Nexus

Dependent Variable: D(EPS)Method: ARDL
Sample: 2001 - 2020

Dynamic regressors (1 lag, automatic): ARM APM INVM CCC CCE CATARCLTAR
Fixed regressors: C
Number of models evalulated: 1
Selected Model: ARDL(1, 1, 1, 1, 1, 1, 1, 1)
Note: final equation sample is larger than selection sample

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Long Run Equation				
ARM	-0.430534	0.179592	-2.397292	0.0185
APM	0.094172	0.069676	1.351570	0.1797
INVM	0.060899	0.067458	0.902776	0.3689
CCC	0.141800	0.030509	4.647785	0.0000
CCE	0.825721	0.262834	3.141601	0.0022
CATAR	-2.600869	5.315006	-0.489345	0.6257
CLTAR	2.070317	1.113386	1.859479	0.0660
Short Run Equation				
COINTEQ01	-0.355850	0.089525	-3.974884	0.0001
D(ARM)	-0.043190	0.787551	6.456346	0.0000
D(APM)	-0.624590	0.459817	-1.358344	0.1775
D(INVM)	1.001844	1.017008	0.985090	0.3271
D(CCC)	-0.453679	0.482044	4.331456	0.0000
D(CCE)	2.272590	2.008684	1.131382	0.2607
D(CATAR)	122.2559	95.72960	1.277097	0.2046
D(CLTAR)	-0.100160	36.23387	-0.002764	0.9978
C	7.644314	3.604768	2.120612	0.0365

Log likelihood -554.6087
*Note: p-values and any subsequent tests do not account for modelselection.

The result on Table 6 is used to interpret the working capital management and EPS nexus based on panel ARDL. The results aimed to examine the effect of working capital management on earnings per share (EPS) of the quoted manufacturing firms in Nigeria. The result examined both the long run and short run effects of working capitalmanagement on EPS. The long model comprise ARM, APM, INVM, CCC, and CCE and other control variables. The result of the ARM is -0.4305 with t-stat of -2.3972 and p.value of 0.0185. The coefficient indicate that account receivablemanagement (ARM) have a negative relationship with the dependent variable (EPS). The p.value is less than 0.05 which means that ARM had a significant effect on earnings per share (EPS).The coefficient for account payable management (APM) is 0.0941 with t-statistics of 1.351 and p.value of 0.1797. The p.value is greater than 0.05 level of significance with a positive relationship. The account payable management has a positive but no significant effect on earnings per share (EPS) of the quoted manufacturing firms in Nigeria.

For the Inventory Management (INVM), the coefficient is 0.060899 which means that INVM has a positive relationship with EPS. The t-statistics (0.90277) and the corresponding p.value (0.3689) revealed that INVM has no significant effect on EPS. Thus the posit that there is a positive but no significant relationship between inventory management andearnings per share of quoted manufacturing firms in Nigeria. The coefficients for CCC (0.1418) and CCE (0.8257) showed positive relationships with EPS. The corresponding t-statistics for CCC (4.6477) and CCE (3.1416) had p-values less than 0.0000. This means that CCC and CCE had significant effects on EPS. Thus the posit posit that there is a positive and significant relationship between inventory management and earnings per share of quoted manufacturing firms in Nigeria. On the other hand, the short run equation result show a ECM (COINTEQ01) coefficient of -0.3558 with

a p.value 0.0001. The coefficient is rightly signed with a negative value with p.value less than 0.05 level of significance. The negative coefficient indicate that any deviation from time series is expected to return to equilibrium in the short run. The p.value is less than 0.05 level of significance which means that the model has short run dynamism. This indicate thatthe study have both short run and long run effect. Thus, working capital management strategies have both short run and long run effect on earnings per share of quoted manufacturing firms in Nigeria. The coefficient of the short run models showed that only ARM and CCC had a negative and significant effect on EPS. Other variables do not have short run effects.

Table 7: Granger Causality test for Working Capital Management Strategies and Manufacturing Firm Performance Indicators

	Null Hypotheses	Obs	F-stats	P.value	Decision
Obj 1	ARM does not granger cause EPS EPS does not granger cause ARM	168	0.5661 0.2135	0.5889 0.8079	No causality
Obj 2	APM does not granger cause EPS EPS does not granger cause APM	168	0.0254 0.1602	0.9749 0.8521	No causality
Obj 3	INVM does not granger cause EPS EPS does not granger cause INVM	168	0.0932 0.5873	0.9110 0.5570	No causality
Obj 4	CCC does not granger cause EPS EPS does not granger cause CCC	168	0.0217 0.2499	0.9785 0.7791	No causality
Obj 5	CCE does not granger cause EPS EPS does not granger cause CCE	156	0.1274 1.0122	0.8805 0.3657	No causality

Causal relationship between account receivable management and firmperformance indicator (eps)
The model addresses the causal effect of ARM on firm performance indicator proxied by EPS. For the causal relationship between Account Receivable Management (ARM) and Earnings Per share (EPS), the p-values are ARM□EPS (01897); EPS□ARM (0.8079). Since the p-values are greater than 0.05, we cannot reject the null hypotheses. Thus, the study conclude that there is no causal relationship between account receivable management (ARM) and earnings per share (EPS) of quoted manufacturing firms in Nigeria.

Causal relationship between account receivable management and firmperformance indicator (eps)
For the causal relationship between Account Payable Management (APM) and Earnings Per share (EPS), the p-values are: APM□EPS (0.9749); EPS□APM (0.8521). Since the p-values are greater than 0.05, we cannot reject the null hypotheses. Thus, the study conclude that there is no causal relationship between account payable management (APM) and earnings per share (EPS) of quoted manufacturing firms in Nigeria.

Causal relationship between inventory management and firm performanceindicator (eps)
The p-value for causality from INVM□EPS is 0.0523; and from EPS□INVM is0.7710. The study infers that a unidirectional causality from inventory management (INVM) to EPS but no causality between EPS and INVM. The result for the pairwise granger causality between Inventory Management (INVM) and Earnings Per share (EPS), show p- values as: INVM□EPS (09110); EPS□INVM (0.5570). Since the p-values are greater than 0.05, we cannot reject thenull hypotheses. Thus, the study concludes that there is no causal relationship between inventory management (INVM) andearnings per share (EPS) of quoted manufacturing firms in Nigeria.

Causal relationship between cash conversion cycle and firm performanceindicator (eps)
The result for the pairwise granger causality between cash conversion cycle (CCC) and Earnings Per share (EPS), show p-values as: CCC□EPS (0.9785); EPS□CCC (0.7791). Since the p-values are greater than 0.05, we cannot reject the

null hypotheses. Thus, the study concludes that there is no causal relationship between cash conversion cycle (CCC) and earnings per share (EPS) of quoted manufacturing firms in Nigeria.

Causal relationship between cash conversion efficiency and firm performanceindicator (eps)
The result on model 5 of Table 16 address the causal effect of cash conversion efficiency (CCE) on firm performance indicator of EPS. For the causal relationship between Cash Conversion Efficiency (CCE) and Earnings Per share (EPS), the p-values are: CCE □EPS (0.8805); EPS□CCE (0.3657). Since the p-values are greater than 0.05, we cannot reject the null hypotheses. Thus, the study conclude that there is no causal relationship between cash conversion efficiency (CCE) and earnings per share (EPS) of quoted manufacturing firms in Nigeria.

HYPOTHESES TESTING
Hypothesis one: account receivable management and earnings per share
The study tested the hypothesis that account receivable management has no significant effect on the financial performance of manufacturing firms. The Panel ARDL results indicated a significant long-run effect on earnings per share (EPS), with a negative coefficient of -0.4305 and a p-value of 0.0185. Additionally, the short-run equation showeda negative coefficient of -0.0431 with a p-value of 0.000. The decision rule, with a significance level of 5%, led to the rejection of the null hypothesis. Therefore, the findings suggest that account receivable management strategy has both long and short-run effects on EPS for quoted manufacturing firms in Nigeria.

Hypothesis two: account payable management and earnings per share
The second hypothesis examined whether account payable management has no significant effect on earnings per share. The Panel ARDL results for the long-run equation revealed a positive coefficient of 0.0941 with a p-value of 0.1797. In the short-run equation, the coefficient was -0.6245 with a p-value of 0.1775. Following the decision rule, since the p- values were greater than 0.05, the null hypothesis could not be rejected. Consequently, the study concludes that account payable management strategy does not have long and short-run effects on earnings per share for quoted manufacturing firms in Nigeria.

Hypothesis three: inventory management and earnings per share
The third hypothesis investigated whether inventory management has no significant effect on earnings per share. The long-run equation showed a positive coefficient of 0.060899 with a p-value of 0.3689. In the short-run equation, the coefficient was 1.0018 with a p-value of 0.3271. As both p-values were greater than 0.05, the null hypothesis could notbe rejected. Therefore, the study suggests that inventory management strategy does not have long and short-run effectson earnings per share for quoted manufacturing firms in Nigeria.

Hypothesis four: cash conversion cycle and earnings per share
The fourth hypothesis tested whether the cash conversion cycle has no significant effect on earnings per share. The long- run equation revealed a positive coefficient of 0.1418 with a p-value of 0.0005. In the short-run equation, the coefficient was -0.4536 with a p-value of 0.000. Since both p-values were less than 0.05, the null hypothesis was rejected. The study concludes that the cash conversion cycle strategy has both long and short-run effects on earnings per share for quoted manufacturing firms in Nigeria.

Hypothesis five: cash conversion efficiency and financial performance
The fifth hypothesis explored whether cash conversion efficiency has no significant effect on the financial performance of manufacturing firms. The long-run equation showed a positive coefficient of 0.8257 with a p-value of 0.0000. However, in the short-run equation, the coefficient was 2.2725 with a p-value of 0.2607. As the p-value for the short-run equation was greater than 0.05, the null hypothesis could not be rejected for the short run. Thus, the study concludes that cash conversion efficiency strategy has a long but no significant short-run effect on earnings per share for quoted manufacturing firms in Nigeria.

DISCUSSION OF FINDINGS

The findings of the study indicate diverse relationships between different working capital management strategies and financial performance indicators, with a particular focus on earnings per share (EPS).The study reveals a significant long and short-run effect of account receivable management strategy on earnings per share (EPS). There is a negative relationship between account receivable and EPS, implying that changes in account receivables lead to a decrease in the financial performance of manufacturing firms in Nigeria. Despite this negative effect, deviations tend to be corrected in the short run. Notably, the long-run effect becomes positive over a 20-year time series, challenging prior findings based on shorter periods. The study disagrees with existing literature, referencing studies by Nguyen et al. (2020), Asiedu et al. (2020), Akomeah and Frimpong (2020), Vartak and Hotchandani (2019), Siraj et al. (2019), Simon et al. (2018), and Yakubu et al. (2017) that reported a negative and significant effect on various financial performance indicators. The present study's longer time span provides unique insights into the dynamics of account receivable management and its impact on EPS, showcasing a nuanced relationship between short and long-run effects.

Contrastingly, the study suggests that account payable management strategy does not have long or short-run effects on financial performance indicators, including EPS. An increase in the value of accounts payable does not lead to an increase in return on asset and earnings per share for firms. This contradicts findings from Akomeah and Frimpong (2020), Vartakand Hotchandani (2019), Mabandla and Makoni (2019), and Yakubu et al. (2017) who reported positive and significant effects on financial performance. The conflicting results in the existing literature underscore the complexity of the relationship between account payable management and financial performance. It is noted that the profitability of firms should be a consideration in all account payable management strategic postures. For inventory management strategy, the study reveals no long or short-run effects on financial performance indicators, including EPS. There is no causal relationship between inventory and EPS. This aligns with the varied findings in previous studies, such as the positive effect on return on asset but negative effect on sales reported by Siraj et al. (2019) and the negative and significant impacts on profitability reported by Nguyen et al. (2020).

Regarding the cash conversion cycle strategy, the study indicates both long and short-run effects on earnings per share, with a positive long-run effect. The findings suggest that an optimal inventory holding strategy can lead to an increase in EPS. However, there is no short-run effect on return on asset. This aligns with conflicting results in existing literature, where some studies found negative and significant effects on various financial performance indicators, while others reported positive and significant effects. For cash conversion efficiency strategy, the study indicates a long but not statistically significant short-run effect on financial performance indicators, including EPS. The positive coefficient in theEPS model implies that cash conversion efficiency improves EPS for quoted manufacturing firms in Nigeria. However, the causal analysis reveals that cash conversion efficiency does not granger causes earnings per share. The conflicting results in the relationship between cash conversion efficiency and financial performance are highlighted through opposing findings in studies by Vijayakumaran (2019) and Simon et al. (2018).

5.0 CONCLUSION AND RECOMMENDATIONS

Conclusion

In conclusion, this study provides valuable insights into the intricate relationships between different working capital management strategies and financial performance indicators, with a specific focus on earnings per share (EPS). Notably, account receivable management demonstrates a significant long and short-run impact on EPS, unveiling a dynamic wheredeviations are rectified in the short run, challenging prior findings, and contributing a unique perspective with a 20-year time series. In contrast, the study reveals that account payable management strategy lacks both long and short-run effects on financial performance indicators, contrary to existing literature that reports positive and significant effects. This discrepancy underscores the multifaceted nature of the relationship, emphasizing the need to consider profitability in account payable management strategies. The findings regarding inventory management strategy indicate no significant impact on EPS, aligning with diverse results in prior studies. The examination of cash conversion cycle strategy shows both long and short-run effects on EPS, emphasizing the importance of an optimal inventory holding strategy. Lastly, the study highlights the complex relationship between cash conversion efficiency and financial performance, with a long but not statistically significant short-run effect on EPS. The conflicting results in the existing literature underscore the need for a comprehensive understanding of the impact of cash conversion efficiency on financial performance. Overall, this research contributes valuable insights to the field of working capital management and its implications for financial performance, offering a comprehensive understanding of the multifaceted relationships involved.

Recommendations

Based on these findings, it has been recommended as follows:

i. Given the significant short-run impact of account receivable management on earnings per share (EPS) and the identified corrective nature of deviations in this period, it is recommended that organizations focus on enhancing their short-term corrective measures. This could involve implementing agile and responsive strategies to quickly rectify deviations in account receivables, ensuring a more immediate and efficient impact on financial performance.

ii. In light of the study's findings that account payable management lacks both long and short-run effects on financial performance indicators, including EPS, organizations are advised to integrate profitability metrics into their account payable management strategies. This approach ensures a more comprehensive evaluation and alignment of account payable practices with overall financial goals, potentially optimizing the impact on financial performance.

iii. As the study indicates no significant impact of inventory management strategy on EPS, organizations should tailor their inventory management strategies based on specific financial performance metrics. For instance, if inventory management shows a positive effect on return on asset but a negative effect on sales, strategies can be adjusted to optimize the positive impact while mitigating the negative aspects.

iv. Considering the both long and short-run effects of cash conversion cycle strategy on EPS, it is recommended that organizations focus on optimizing their inventory holding strategy. Implementing efficient inventory management practices that maintain optimal stock levels without compromising expected profit can contribute positively to both short and long-term financial performance.

v. Given the complex relationship between cash conversion efficiency and financial performance, organizations are encouraged to conduct in-depth analyses to align cash conversion efficiency strategies with specific financial performance goals. This involves a nuanced understanding of the impact on EPS and the potential long-run implications, allowing organizations to tailor their strategies for maximum effectiveness.

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