

EFFECT OF ACCOUNT PAYABLE PERIOD, CASH CONVERSION CYCLE AND LIQUIDITY RATIO ON THE PERFORMANCE OF QUOTED MANUFACTURING COMPANIES IN NIGERIA

¹ECHOR Jacob & ²Dr. ABDUL Adamu

^{1&2}Department of Business Administration, Nasarawa State University, Keffi

Abstract

This study examined the effect of Account Payable Period, Cash Conversion Cycle and Liquidity Ratio on the performance of quoted manufacturing companies in Nigeria. Research design used for this study is secondary data; data was collected from financial statements of twenty-six (26) quoted manufacturing companies in Nigeria from 2011 to 2021. Account Payable Period, Cash Conversion Cycle and Liquidity Ratio were adopted as the proxies for independent variables while Return on Asset as proxy of performance. Panel Regression (Pooled, fixed and random effects) was estimated and fixed effect model was adopted as a better estimator. The result revealed that Account Payable Period and Liquidity Ratio has no significant effect on the performance of quoted manufacturing companies in Nigeria while Cash Conversion Cycle has significant effect on the performance of quoted manufacturing companies in Nigeria. This study thus, recommended that; managers of quoted manufacturing companies should look closely at the terms of agreement with suppliers to haste payment of Account Payables in order to enhance better returns, and pay attention to liquidity performance in order to meet the operational and expansion process requirements to achieve the aspirations of the shareholders through enhancing their wealth. Finally, since cash conversion cycle has a significant effect on performance of quoted manufacturing companies, shareholders and managers should look into cash conversion cycle policy time-lag, and ensure effective resource management because of their importance to corporate sustainability.

Keywords: *Account Payable Period, Cash Conversion Cycle, ROA, Liquidity Panel analysis, Fixed, Random, Pooled Hausman.*

INTRODUCTION

Manufacturing Sector (MS) has been regarded as the second largest employer of labor after Agriculture and third largest contribution to Nigeria economy after Oil and Agriculture. Its importance has always been recognized because of its economic stabilization, capacity to stimulate favorable trade balances, job and wealth creation potentials.

The manufacturing industry has frequently been referred to as a global driver for development and economic prosperity. It is commonly believed to be a vital tool for accelerating the development and expansion of any country's economy. It also plays a big part in the modern economy and offers other vital advantages that are highly pertinent for economic transformation. It is frequently referred to as a hub for wealth development, job possibilities, and economic progress (Onodje, 2014). However, the collapse of the global economy and the challenging business climate in Nigeria has hurt their capital returns, leaving the majority of them fighting for survival.

The recent COVID-19 pandemic revealed that manufacturing sector has an even bigger role to play in stabilizing the economy. For instance, during the pandemic, the manufacturing sector (Food, Beverage & Tobacco and Chemical & Pharmaceutical) was one of the leading sectors that stood in for the country's economic needs. Without a growing manufacturing sector, the country would have had huge dependence on imports and fluctuations in oil prices. These trends would have continued to result in foreign exchange scarcity, economic shocks, and depression. So, growing our manufacturing is about achieving economic resilience. Few studies carried out on this area have different outcomes on the effect of Account Payable Period (APP), Cash Conversion Cycle (CCC) and Liquidity Ratio (LR) on the performance of quoted manufacturing companies in Nigeria. Thus this study seeks to investigate the effect of Account Payable Period, Cash Conversion Cycle and Liquidity Ratio on the performance of quoted manufacturing companies in Nigeria. Based on the foregoing the

study tends to investigate the effect of working capital management on the performance of quoted manufacturing companies in Nigeria. The proxies of WCM in this study are APP, CCC and LR while the proxy for performance is ROA.

Working Capital Management (WCM) is considered to be the lifeblood and a nerve Centre for any business activities, it provides an inherent strength to meet the daily needs of the business in order to face the financial crisis (Dixit, 2015). It is been referred to as life wire of any economic activity as such its management is regarded among the most important functions of corporate management. Every organization irrespective of their size and nature of business requires enough WC as the most crucial factor for maintaining liquidity, survival, solvency and profitability of business. The greater the relative proportion of liquid assets, the lesser the risk of running out of cash, all other things being equal (Mukhopadhyay, 2004).

Umara et al., (2009) stated that management of working capital is important to the financial health of business of all sizes because the amounts invested in working capital are often high in proportion to the total assets employed. In light of the largest percentage that working capital form in relation to the overall assets of a manufacturing company in particular, proper attention should be given to the management of current assets, current liabilities and the relationships that exist between them.

Taulia (n.d) defined working capital management as a business tool that helps companies effectively make use of current assets and current liabilities to maintain sufficient cash flow to meet short-term goals and obligations. By effectively managing working capital, companies can free up cash that would otherwise be trapped on their balance sheets. As a result, they may be able to reduce the need for external borrowing, expand their businesses, fund mergers or acquisitions, or invest in research and development (R&D). It is essential to the health of every business, but managing it effectively is something of a balancing act. Companies need to have enough cash available to cover both planned and unexpected costs, while also making the best use of the funds available. This is achieved by the effective management of [accounts payable](#), [accounts receivable](#), inventory, and cash (Taulia, n.d).

Working capital management is a business tool that helps companies effectively make use of current assets and current liabilities to maintain sufficient cash flow to meet short-term goals and obligations. It is refers to as the decisions relating to working capital and short- term financing and involves managing the relationship between a firm's short –term assets and its short –term liabilities. The goal is to ensure that the firm is able to continue its operations and that it has sufficient cash flow to satisfy both maturing short-term debt and upcoming operational expenses (Abdul-Kadir et al., 2017).

Pandey (2003) asserted that working capital is required to finance the day-to-day activities of a firm and provide for growth. The need for working capital in a business organization cannot be overemphasized. There are hardly any business organizations that do not require any amount of working capital. However, firms differ in their requirement of working capital. When a company grows and its output increases, the volume of its working capital or net current assets will also increase. The volume of net current assets will also depend on the policies adopted by a company for managing individual current assets. A company with no stock, no debtors and no creditors will have little or no investment in working capital which will result in little or no profit

LITERATURE REVIEW

Concept of Performance

Many scholars have continuously insisted that no standardized or uniform definition of performance exists, and they argued on how it is a multidimensional concept. Samsonowa (2012) argued that all the different definitions reviewed, in the performance measurement literature, have one common characteristic; they all are related to two terms: effectiveness and efficiency; effectiveness as an indicator of the degree of a goal attainment, and efficiency as an indicator of the resources that were consumed to reach the level of achievement. Samsonowa

(2012) stated that, the term “performance” as the level of goal achievement of an organization/department rather than of individuals.

Concept of Accounts Payable Period

Accounts payable is a liability that is derived from the purchase of goods on credit. Extending period of payment could increase the profitability of the business (Avlonitis & Salavou, 2007). Nonetheless, deferment of payments has the ability to damage the credit reputation of the firm and alternatively affect the profitability of the business negatively in the long run (Mugo, 2016). Delaying payment to suppliers provides enough duration of time for the businesses to access the quality of the products. In addition, it's a flexible source of financing and it's inexpensive. Nonetheless, Mwangi et al., (2013) noted that the implicit cost derived from the late payment as the business foregoes early payment discounts.

Account payables are the opposite of account receivables, instead of giving a credit on a sale, a firm receives a credit. Abdul-Kadir et al., (2017) explained account payables as follows: When a firm makes a purchase on credit, it incurs an obligation to pay for the goods according to the terms given by the seller. Until the cash is paid for the goods the obligation to pay is recorded in accounts payables. It is calculated in the same way receivable turnover is computed. According to Van-Horne and Wachowicz (2008) account payable period or payable turnover in days (PTD) can be computed as: $\text{Days in the Year/Payable Turnover}$, Or $\text{Accounts Payable} \times \text{Days in the Year/Annual Credit Purchases}$.

Falope and Ajilore (2009) viewed accounts payable (AP) as suppliers whose invoices for goods or services have been processed but have not yet been paid. Organizations often regard the amount owing to creditors as a source of free credit because it has no identifiable interest charges. It is in view of this that accounts payable are always regarded as a major source of working capital financing for firms (Pandey, 2005). Therefore, strong alliance between company and its suppliers will strategically improve production lines and strengthen credit record for future expansion.

Concept of Cash Conversion Cycle

Cash conversion cycle is an important metric that used to assess the effectiveness of the company's overall financial health (Ciprian Maria, 2018). The cash conversion cycle measures the number of days between the expenditure of the company's cash for the acquisition of raw materials to manufacture the products, and the collection of cash obtained from the sale of the finished goods (Sathyamoorthi & Wally-Dima, 2018). Cash conversion reveals how the enterprises are performing and, at the same time, helps to dig out the areas where further improvement is demanded (Hutchison et al., 2007). The cash conversion cycle has three elements: inventory conversion period, average receivables period and average payables period. Firms can improve their profitability by reducing their length of cash conversion cycle through decreasing the receivables collection period, prolonging the credit payment period or lessening the inventory selling period (Anser & Malik, 2007). The cash conversion cycle is an important performance metric for analyzing how well a company is managing its working capital (Ciprian & Maria, 2018).

Cash conversion cycle also known as cash cycle is a measure of the time between cash disbursement and cash collection. It is simply the number of days that passes before collection of cash from sales, measured from when organizations actually pay for inventories. It can be expressed as $\text{accounts receivable period} + \text{inventory period} - \text{accounts payable}$, (Obalemo et al., 2020). Cash conversion cycle is determined from the time taken to purchase raw materials, through manufacturing until collecting money from sale of goods on account (Besley and Brigham 2005). The CCC is measured by deducting the payment deferral period made to suppliers from the total of inventory conversion period and receivables collection period (Yucel & Kurt, 2002). Payment deferral period (payment cycle) is the time a firm takes for raw materials to be ordered, received and paid for. Inventory conversion period (production cycle) is the time it takes to manufacture and sell its inventory.

Receivables collection period (cash collection cycle) is the length of time a firm needs to collect the money from its credit sales (Obalemo et al., 2020).

Cash conversion cycle is a measure that is widely used to evaluate the risks and returns associated with management of liquidity (Gorondutse et al., 2017). According to Napompech (2012) every corporate organization is concerned greatly on how to improve and sustain profitability. In the contemporary competitive environment, sustainability of the businesses remains subject to the ability and success of financial management function. Nthiwa et al., (2013) opined that efficient management of the cash conversion cycle provides a surety on the long run survival of the business.

Concept of Liquidity Ratio

Liquidity management is a concept that is receiving serious attention all over the world especially with the current financial situations and the state of the world economy. The concern of business owners and managers all over the world is to devise a strategy of managing their day to day operations in order to meet their obligations as they fall due and increase profitability and shareholder's wealth. Liquidity management, in most cases, are considered from the perspective of working capital management as most of the indices used for measuring corporate liquidity are a function of the components of working capital. The importance of liquidity management as it affects corporate profitability in today's business cannot be over emphasis. The crucial part in managing working capital is required maintaining its liquidity in day-to-day operation to ensure its smooth running and meets its obligation (Eljelly, 2004). Liquidity plays a significant role in the successful functioning of a business firm. A firm should ensure that it does not suffer from lack-of or excess liquidity to meet its short-term compulsions. A study of liquidity is of major importance to both the internal and the external analysts because of its close relationship with day-to-day operations of a business (Bhunia, 2010). Dilemma in liquidity management is to achieve desired trade-off between liquidity and profitability (Raheman et al., 2007). Liquidity requirement of a firm depends on the peculiar nature of the firm and there is no specific rule on determining the optimal level of liquidity that a firm can maintain in order to ensure positive impact on its profitability.

Liquidity is one of the most important goals of working capital management and central task of revenue optimization and company's financial performance. Efficient working capital management leads to an improved in the operating performance of the business concern and it helps to meet the short-term liquidity (Maness and Zietlow, 2005; Samiloglu and Demirgunes, 2008). Increased use of overdrafts, lateness in payments of trade creditors, and decreasing cash balances may all signal a weakening liquidity position and a potentially increased probability of default (Calistus et al., 2018). Current liability coverage ratio, a measure of a firm's liquidity position provides a litmus test for firm's solvency. It is considered the most accurate method as cash used to pay off dividends is subtracted thus giving a truer picture of the operating cash flow. GARP (2015) contended that liquidity is essentially a short-term problem caused by short-term unexpected liabilities and the funding requirements of long-term liabilities that have adverse effect on firm financial performance. Liquidity risk therefore arises from the variability in short-term assets and liabilities and short-term components of long-term assets and liabilities (Calistus et al., 2018).

A liquidity management strategy means the business has a plan for meeting its short-term and immediate cash obligations without experiencing significant losses. It means the company is managing its assets, including cash to meet all liabilities, cover all expenses and maintain financial stability. For over-leveraged companies, a liquidity management strategy includes developing steps to reduce the gap between the cash available on hand and their debt obligations (Dahiyat et al., 2021). Liquidity management is a set of ongoing strategies and processes that ensure your business is able to access cash as needed — to pay for goods and services, make payroll, and invest in new opportunities that arise. Liquidity also plays a big role in making investment decisions because most investment decisions are associated with the amount of available liquidity (Dahiyat et al., 2021).

Liquidity management is achieved through the effective use of assets (Robinson et al., 2015). According to (Durah et al., 2016) liquidity ratios include the following: i) current ratio; which measure the company's ability to pay short-term liabilities such as payable accounts and short-term loans, which represents the ratio of current assets to current liabilities. The magnitude of this ratio expresses high liquidity of the company, thus a greater capacity to meet the short-term liabilities. In contrast, decrease in the ratio under 1, expresses the deficit of liquidity and the part of the fixed assets financed by short-term debt. Although liquidity deficit could lead to a decline in the company's energy, thus can affect profitability. If the ratio equal to 1, it means that current assets equal to current liabilities (Robinson et al., 2015); ii) Quick ratio which is only includes the most liquid of current assets to current liabilities. The rise in the value of this ratio expresses high liquidity of the company. This ratio excludes prepaid expenses and inventory from current assets being difficult conversion into cash (Sinha, 2012) Cash ratio which shows that current assets depends only on short-term marketable investments plus its cash attributed to current liabilities (Gibson, 2009); and iv) Defensive interval ratio which refers to the period in which the company can continue to pay the expenses of the existing liquidity without resorting to obtain cash flows from outside the company (Robinson et al., 2015).

Liquidity is the ability of a firm to meet short term financial obligations via conversion of current asset into cash without suffering any loss (Akenga, 2017). Liquidity in companies implies dimensions; quantitative and qualitative. The quantitative aspect includes the ability of a firm to meet all present and potential demands on cash in a manner that minimize cost and maximize the value of the business. Liquidity of a firm can be measured via the current ratio, quick ratio and cash conversion cycle. Liquidity is an important issue in financial decision making. It includes investment in asset that requires appropriate financing investment. However, liquidity issues are usually neglected by the firms in financial decision making as it involves investment and financing in the short term period. If firms have good relationships with their trade creditors, they might be able to solicit their help in providing short term working capital (Nazish & Shehla 2017). Samiloglu and Demirgunes (2008) defined that liquidity management in literature is simple and a straightforward concept that ensures the ability of the organization to fund the difference between the current assets and current liabilities.

Empirical Review

Mohammed (2020) conducted research on the impact of working capital management on financial performance from Jordan. The objective of the study was to investigate the impact of working capital management on profitability. Working capital management was measured using; average collection period, average age of inventory, average payable period and cash conversion cycle as a comprehensive measure of working capital management. Two measures of profitability were employed; return on assets and net profit margin. The sample consisted of 33 industrial companies listed on Amman stock exchange (ASE) for the period from 2013-2017. Data required was gathered manually through the annual reports publicly available on (ASE). Panel data methodology was used with eight multiple regressions to test the study hypotheses. The findings revealed that average collection period and average age of inventory have a negative and significant impact on profitability measures; this implies that managers can enhance profitability by keeping average collection period and average age on inventory at the reasonable minimum level. However, the findings found no impact of cash conversion cycle on the net profit margin.

Oladipo, Adegboyo and Olugbamiye (2020) carried out a study, Effects of Working Capital Management on Profitability of Manufacturing Firms in Nigeria. The study examined the impact of working capital management on profitability in manufacturing firms in Nigeria between the period of 1988 and 2019. The study disaggregated capital management into trade receivables, inventory, cash and bank balances and trade payables in line with the theories reviewed. The data were obtained from the company review published audit financial report. Based on the mixed level of stationarity of the variables as revealed by the unit root test, the study made use of auto-regressive distributed lag (ARDL) technique to analysis the data. The bound test revealed that; there was presence of co-integration (long-run relationship) among the dependent and all the explanatory variables consequently the study estimated the ARDLECM. The result further showed that

Cash and Bank Balances (CBB), Trade Payables (TAP) and Trade Receivables (TAR) had a positive and significant impact on profitability of manufacturing firms in Nigeria which is a clear indication that working capital management has positive and significant impact on company profitability in Nigeria both in short and long run. The findings of this study are in tandem with Keynesian Liquidity preference theory. This study recommended that financial managers increase their working capital and ensure that it is properly managed in order to enhance sales revenue, thus strengthening firm profitability. Furthermore, the study suggested that financial managers should increase investment in working capital to accelerate their productivity so that they can also improve the profitability of the firms.

Abdul-Khadir, et al. (2020) examined the effect of working capital management (WCM) on the financial Performance of quoted conglomerate firms in Nigeria for the period 2006 to 2016. Account receivable period (ARP), account payable period (APP), inventory turnover period (ITP) and cash conversion cycle (CCC) were adopted as the proxies for WCM while return on equity (ROE), return on assets (ROA) and return on investments (ROI) were adopted as proxies for financial performance. Secondary data were obtained from ten (10) quoted conglomerate firms' financial statements and Structural Equation Modeling (SEM) was used for the analysis. The study revealed that APP and CCC have positive effect on financial performance; while ARP and INV have negative effect on financial performance. The general result indicates that there is significant effect of WCM on financial performance (ROA, ROE and ROI) of quoted conglomerate firms in Nigeria. It is recommended that the companies should; ensure speedy collections of account receivables; increase account payable period; formulate and implement effective strategies or inventory management system that minimizes inventory turnover period and management should ensure that investments in working capital is optimized by reducing the length of time from the actual outlay of cash for purchases until the collection of receivables resulting from the sales of goods or services.

Obalemo et al, (2020) study examined the effect of the cash conversion cycle (CCC) period on the profitability of selected food and beverage companies in Nigeria. The study used five years period from 2014 to 2018. The study adopted the ex-post facto research design. The population is 43 food and beverage companies listed on the Nigerian stock exchange during the period of study. The study uses judgmental sampling techniques to select the sample based on the following criteria and the sample size is ten (10) food and beverage firms in Nigeria. The study used panel regression and analyzed the data using an e-view statistical package of 9.00. The findings indicate that the Cash Conversion Cycle (CCC) has a significant negative relationship with profitability (measured by ROA). The study also recommended that managers should pay more attention to proper inventory management. This may be achieved by setting certain standards that will help to maintain inventory at the optimal level.

Dahiyat et al., (2021) study examined the impact of liquidity and solvency management on the financial performance of Jordanian manufacturing companies listed on the Amman Stock Exchange, for a period of 10 years from 2010 to 2019. The size of the company was used as a control variable. The study employed Return on Assets (ROA) and Earnings Per Share (EPS) to measure financial performance. Current ratio (CR) and total debts to total assets were used as proxies for liquidity and solvency management, while logarithm of total assets was used to measure the size. Correlation and multi regression analyses have been applied to analyze the data. The results showed a statistically significant impact of independent and control variables (liquidity and solvency management and the size of the company) on financial performance, while the detailed results of the hypotheses indicate that liquidity has an insignificant reverse impact on financial performance. With respect to other variables, there is a significant positive impact of size on performance and a significant negative impact of solvency on performance. The study suggested in light of results, increasing investments in companies' assets by focusing on internal financing, such that large-sized companies with low leverage will have a good performance.

Ogungbade et al., (2020) study examined the effect of liquidity on the performance of listed manufacturing companies in Nigeria. The study employed an explanatory research design to assess the relationship using data obtained from audited financial statements of 16 manufacturing firms in the consumer goods sector from 2009-2018. The collected data were analysed using SPSS and E-View. The study employed panel multiple regression to analyse the data. The research found out that the quick ratio has a significant adverse effect on the performance of listed manufacturing firms. In contrast, current ratio and cash conversion cycle have no considerable impact. The study concluded that liquidity has a substantial effect on the performance of manufacturing companies in Nigeria. Still, in no small extent, the manufacturing firms in Nigeria did not profitably maintain their liquidity levels. The study recommended that manufacturing firms should put down, and follow strict adherence to policies and practices that help the firm to maintain a proper balance between their liquidity position and profitability.

Adesina and Olatise (2020) study examined the impact of the liquidity management on the performance of the 10 (ten) manufacturing firms selected for the period of five years 2012-2016. Secondary data were collected from the annual reports and accounts of these firms. Data sources of the study are audited annual reports of the selected firms. Descriptive statistics, correlation and regression analyses were used for data analysis. The study revealed that current ratio has negative and significant impact on profitability (ROA) of the selected firms while quick and cash ratios have positive but insignificant relationship with ROA. Therefore, it is recommended that attention should be purposely paid to Liquidity management in the manufacturing firms in Nigeria in order to enhance their profitability.

Cash Conversion Cycle Theory

Gitman (1974) propounded that Cash Conversion Cycle is the time it takes a manufacturing company to achieve maximum returns and is equal to Inventory plus Account Receivables minus Account Payables. Cash Conversion Cycle Theory's (CCCT) main focus is on the length of time between the acquisition of raw materials and other inputs and the inflows of cash from the sale of finished goods, and represents the number of days of operation for which financing is needed.

The cash conversion cycle theory is a dynamic measure of ongoing liquidity management, since it combines both balance sheet and income statement data to create a measure with a time dimension (Jose & Lancaster, 1996). While the analysis of an individual firm's CCC is helpful, industry benchmarks are crucial for a company to evaluate its CCC performance and assess opportunities for improvements because the length of CCC may differ from industry to industry. Therefore the correct way is to compare a specific firm to the industry in which it operates.

The cash conversion cycle is used as a comprehensive measure of working capital as it shows the time lag between expenditure for the purchase of raw materials and the collection of sales of finished goods (Padachi, 2006). Day-to-day management of a firm's short term assets and liabilities plays an important role in the success of the firm. Firms with growing long term prospects and healthy bottom lines do not remain solvent without good liquidity management (Jose & Lancaster, 1996).

This study was anchored on cash conversion cycle theory, because in total it is said to be the most convenient and central one in elucidating working capital management as it deals with all concepts and components, ranging from raw materials to finished products, and outputs representing inventory levels, to receivables and payment representing the cash aspect (Yusuf Aminu and Nasruddin Zainudin, 2015).

METHODOLOGY

The study adopted the longitudinal causal research design which explains the causal relationship between the dependent and independent variables. Since this is a causal study, the research seeks to establish the causal relationship of the effect of Account Payable Period, Cash Conversion Cycle and Liquidity Ratio on the

performance of quoted manufacturing companies in Nigeria. Data were collected from the financial statement of twenty-six (26) manufacturing firms in Nigeria from 2011 to 2021. This study adopted a panel regression estimation technique. Panel data is an important method of longitudinal data analysis because it allows for a number of regression analyses in both spatial (units) and temporal (time) dimensions. In Panel regression, there are three possibilities: Pooled Regression Model, Fixed Effect Model, and the Random Effects Model. These three are commonly used in empirical studies (Greene, 2008). The model is stated thus:

$$ROA_{it} = \omega_0 + \alpha_1 APP_{it} + \alpha_2 CCC_{it} + \alpha_3 LDR_{it} + U_{it} \quad \dots (1)$$

Where:

ROA_{it} = Return on Asset (Performance) of Firm i in time t.

APP_{it} = Account Payable period of firm i in time t.

CCC_{it} = Cash Conversion Cycle of firm i in time t.

LDR_{it} = Liquidity Ratio of firm i in time t.

i = number of firms (1, 2, 3,25)

t = 2010, 2011, 2012...2022

U_{it} = Component error term

ω_0 = constant intercept

α_1, α_2 and α_3 = the coefficients the independent variables, Account receivable period, cash conversion cycle, and liquidity ratio.

RESULTS AND DISCUSSION

Table 1

Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
roa	286	.1836597	1.29142	-3.03787	19.21667
app	286	3.168669	4.800076	-9.774436	56.93508
ccc	285	16.16333	1.850669	11.71429	19.26412
liq	286	1.6189	2.654729	-.2178437	29.12149

Source: Stata 15

Table 1 shows the descriptive statistics for variables Account Payable period (APP), Cash Conversion Cycle (CCC), Liquidity Ratio (LDR) and Return on Asset (ROA). The results indicated that the mean of ROA for the firms under study is 0.184. The mean value of account receivable period (ARP) is 83.975. While the mean values for account payable period (APP), Cash Conversion Cycle (CCC) and Liquidity Ratio (LDR) are 3.169, 16.163 and 1.619 respectively. This means that the ROA mean value is a little over 0.18 ratio. But the firms on the average keep inventory turnover period of at least 7 days. However, the firms on the average have Account Payable period (APP) of 84 days. Finally their average account payable period (APP), Cash Conversion Cycle (CCC) and Liquidity Ratio (LDR) are 3 days, 16 days and 2 percent.

Table 2

Correlation Matrix

	roa	itr	app	ccc	liq
roa	1.0000				
app	0.0001	1.0000			
ccc	0.1050	-0.0806	1.0000		

liq | -0.0313 -0.0369 0.1043 1.0000

Source: Stata 15

Table 2 shows result of the matrix correlation for the relationship between the independent variables and the dependent variable. The result revealed that Account Payable period (APP), and Cash Conversion Cycle (CCC) has positive correlation to ROA. While, Liquidity Ratio (LDR) correlate negative to Return on Asset (ROA). The result showed that Account Payable Period (APP) correlates to Return on Asset (ROA) by 0.01% and cash conversion rate (CCC) correlate to ROA by 10.50%. However, Liquidity (LIQ) correlates negatively to ROA by 3.13%. This means that the correlation coefficients for the variables Account Payable period (APP), Cash Conversion Cycle (CCC), Liquidity Ratio (LDR) with Return on Asset (ROA) are all weakly correlated

Table 3
Panel Unit Root Test – Im, Pesaran and Shin (IPS)

Variable	Level	First order difference
	Constant	Constant
APP	-2.9069** (0.0000)	-3.9423** (0.0000)
CCC	-2.2170** (0.0103)	-3.9121** (0.0000)
LDR	-2.4036** (0.0000)	-4.0849** (0.0000)
ROA	-2.7024** (0.0001)	-4.7636** (0.0000)

Source: Stata 15

Note: ** indicates rejection of the null hypothesis of no unit root at 5%, levels of significance

Table 3 also presents the results of the tests at first difference for IPS test in constant. It can be seen that for all series the null hypothesis of unit root test is rejected at 5 percent critical value. Because the p-values at level are below the level of significance of 0.05. Hence, based on IPS test, there strong evidence that all the series are in fact integrated at level i.e. at I (0). It can be conclude that the results of panel unit root tests (IPS tests) reported in Table 3 support the hypothesis of no unit root in all variables across the manufacturing firms. Given the results of IPS tests, it is not necessary to apply panel co-integration method in order to test for the existence of the stable long-run relation among the variables.

Table 4
Pedroni Residual Cointegration Test

Alternative hypothesis: common AR coefs. (within-dimension)				
	<u>Statistic</u>	<u>Prob.</u>	<u>Statistic</u>	<u>Prob.</u>
Panel v-Statistic	-1.932633	0.9734	-2.460649	0.9931
Panel rho-Statistic	1.855887	0.9683	2.243416	0.9876
Panel PP-Statistic	-10.56944	0.0000	-11.85775	0.0000
Panel ADF-Statistic	-1.566472	0.0586	-2.410158	0.0080
	<u>Statistic</u>	<u>Prob.</u>		
Group rho-Statistic	3.286182	0.9995		
Group PP-Statistic	-21.51537	0.0000		

Group ADF-Statistic	-2.231498	0.0128
---------------------	-----------	--------

Source: Eviews 10

The Pedroni co-integration test in Table 4 rejected the null hypothesis of no co-integration for the variables given that four of the statistics are significant as against three statistics.

Table 5: Results of Pooled, Fixed and Random Effects Regression Estimates

	Fixed effect	
	Coeff	P-value
<i>APP_{it}</i>	0.00979	(0.7530)
<i>CCC_{it}</i>	0.34535	(0.0010)
<i>LIQ_{it}</i>	-0.00167	(0.9950)
CONST	-6.46024	(0.0000)
R ²	0.0108	
N	285	
F*	3.58	(0.0038)

Source: Stata 15: **Dependent variable:** (*ROA_{it}*).

Note: * ** *** show significance at 1 percent, 5 percent and 10 percent respectively.

Table 5 shows the summary of results for the pooled regression, random effect and fixed effect models. The result shows that the Hausman specification test indicated that the fixed effect model is a better estimator than the Random effect model since the Hausman test result has a high value of 20.30 of the Chi-square, with a p-value (0.0000) lesser than 0.05 significance level. Also, the fixed effect is also a better estimator than the pooled regression model because the Lagrangian Multiplier test indicated that there exists a panel effect between the fixed and the Pooled regression model. The value of the Lagrangian Multiplier which is 55.59 with a low p-value of 0.0000 indicated the existence of Panel effect (appendix).

The fixed effects result revealed that the R² is 1.08%. This means that a change in the dependent variable which is return on asset (ROA) is as a result of the changes in the independent variables Account Payable period (APP), Cash Conversion Cycle (CCC), and Liquidity Ratio (LDR). While the remaining 98.92% maybe caused by other factors not included in the model which could be government policy, environmental factors or business environments.

The F-statistic reported in the panel regression in table 5 is from a test of the hypothesis that all of the slope coefficients (excluding the constant, or intercept) in a regression are zero. The p-value given just below the F-statistic, denoted Prob (F-statistic), is the marginal significance level of the F-test. If the p-value is less than the significance level of 0.05, reject the null hypothesis that all slope coefficients are equal to zero. From the result, the p-value of the F-statistic (0.0038) which is essentially mean that the null hypothesis is rejected that all of the regression coefficients are zero. This indicated a good fit of the model

The result in table 5 shows that the relationship between Account Payable period (APP) and return on asset (ROA) is positive and statistically insignificant ($\beta = 0.00979$, P-value = 0.7530 > 0.05. This means that a positive change in Account Payable period (APP) of listed manufacturing firms in Nigeria positively influences the Return on Asset (ROA).

The result in table 5 indicate that the relationship between Cash Conversion Cycle (CCC) and return on Asset (ROA) is positive and statistically significant ($\beta = 0.34535$, P-value = 0.0010 < 0.05. This means that a positive change in Cash Conversion Cycle (CCC) influence is associated with positive change in the return on asset (ROA) of listed manufacturing firms in Nigeria.

The result in table 5 indicate that the relationship between Liquidity Ratio (LDR) and **Return on Asset (ROA)** is negative and statistically insignificant ($\beta = -0.00167$, P-value = $0.9950 > 0.05$). This means that a negative change in **Return on Asset** influences is associated with negative change in Liquidity Ratio (LDR) of listed manufacturing firms in Nigeria.

Hypothesis one

H₀₁: Account Payable Period has no significant effect on the performance of quoted manufacturing companies in Nigeria

Decision rule

The decision rule is that if the p-value is less than the level of significance of 0.05, the null hypothesis will be rejected while the alternate hypothesis is accepted. But if the p-value is greater than the level of 0.05, we fail to reject null hypothesis and reject the alternate.

From the result of the p-value for Account Payable Period in Tables 5, is 0.7530, is more than the level of significance of 0.05. Therefore, we fail to reject the null hypothesis and reject the alternate hypothesis; hence, Account Payable Period has no significant effect on the performance of quoted manufacturing companies in Nigeria

Hypothesis Two

H₀₂: Cash Conversion Cycle has no significant effect on the performance of quoted manufacturing companies in Nigeria

Decision rule

The decision rule is that if the p-value is less than the level of significance of 0.05, the null hypothesis will be rejected while the alternate hypothesis is accepted. But if the p-value is greater than the level of 0.05, we fail to reject null hypothesis and reject the alternate.

From the result of the p-value for Cash Conversion Cycle and return on asset in Tables 5, is 0.0010, is less than the level of significance of 0.05. Therefore, we reject the null hypothesis and accept the alternate hypothesis, thus, Cash Conversion Cycle has significant effect on the performance of quoted manufacturing companies in Nigeria

Hypothesis Three

H₀₃: Liquidity Ratio has no significant effect on the performance of quoted manufacturing companies in Nigeria.

Decision rule

The decision rule is that if the p-value is less than the level of significance of 0.05, the null hypothesis will be rejected while the alternate hypothesis is accepted. But if the p-value is greater than the level of 0.05, we fail to reject null hypothesis and reject the alternate.

From the result of the p-value for Liquidity ratio in Tables 5, is 0.9950, is greater than the level of significance of 0.05. Therefore, we fail to reject the null hypothesis and reject the alternate hypothesis, thus, Liquidity Ratio has no significant effect on the performance of quoted manufacturing companies in Nigeria.

DISCUSSION OF FINDINGS

In hypothesis one, it was found that Account Payable Period has no significant effect on the performance of quoted manufacturing companies in Nigeria. This is consistent with the work of Mohammed (2020) who conducted research on the impact of working capital management on financial performance from Jordan. The findings revealed that average collection period has no significant impact on profitability measures; this implies that managers can enhance profitability by keeping average collection period at reasonable minimum level.

Consequently, the result of this present study does agree to the findings of Jacob and Siaw (2019), who found that account Payables period (APP) had insignificant positive effects on the profitability.

For hypothesis two, Cash Conversion Cycle has significant effect on the performance of quoted manufacturing companies in Nigeria. This result does agree with the work of Abdul-Khadir, Abdul, & Aliyu (2020) and that of Obalemo et al, (2020).

For hypothesis three, Liquidity Ratio has no significant effect on the performance of quoted manufacturing companies in Nigeria. This result does not agree with the work of Dahiyat et al., (2021), who found that Liquidity Ratio has significant effect on financial performance.

However, the result of this present study does agree to the findings of Ogungbade et al., (2020) who found that liquidity has a substantial effect on the performance of manufacturing companies in Nigeria. Still, in no small extent, the manufacturing firms in Nigeria did not profitably maintain their liquidity levels. But it does not agree with the findings of Adegbie and Adesanmi (2020) who found that corporate sustainability of quoted oil and gas companies in Nigerian was significantly affected by liquidity management.

This study adopted cash conversion cycle theory because in total, it is said to be the most convenient and central one in elucidating working capital management as it deals with all concepts and components, ranging from raw materials to finished products, and outputs representing inventory levels, to receivables and payment representing the cash aspect.

The finding of this study is in agreement with CCCT as they indicate that there is a strong relationship between WC and the components employed in this study. As propounded by Gitman (1974), Cash Conversion Cycle is the time it takes a manufacturing company to achieve maximum returns is equal to Inventory plus Account Receivables minus Account Payables.

CONCLUSION AND RECOMMENDATIONS

This research empirically examined the effect of Account Payable Period, Cash Conversion Cycle and Liquidity Ratio on the performance of quoted manufacturing companies in Nigeria. A Panel regression (fixed effect) econometric technique was used to achieve the desired objectives. The findings of the study showed that Account Payable Period and return on Asset (ROA) is positive and statistically insignificant and Liquidity Ratio and return on asset (ROA) is negative and statistically insignificant effect on the performance of quoted manufacturing companies in Nigeria while Cash Conversion Cycle has positive and statistically significant effect on the performance of quoted manufacturing companies in Nigeria. This study thus, recommended that; managers of quoted manufacturing companies should keep Account Payable Period at reasonable level to enhance profitability. Also there is need to pay attention to liquidity and performance in order to meet the operational and expansion process requirements as well as achieving the aspirations of the shareholders through enhancing their wealth. Finally, since cash conversion cycle has a significant effect on performance of quoted manufacturing companies, shareholders and managers should look into cash conversion cycle policy time-lag, and ensure effective resource management because of their importance to corporate sustainability.

REFERENCES

- Abdul-Kadir, M.I., Abdul, A. & Aliyu, S. (2017). Effect of working capital management on financial performance of quoted conglomerate firms in Nigeria. *AE-Funai Journal of Accounting Business and Finance (FJABAF)*.ISSN:2635-392X. www.fjabf.org.
- Abdul-Khadir M. I., Abdul, A. & Aliyu, S. (2020). *Effect of working capital management on financial performance of quoted conglomerate firms in Nigeria*, <https://www.fjabf.org>
- Adesina, O. D. & Olatise, F. A. (2020). Impact of liquidity management on profitability of selected manufacturing firms in Nigeria. *European Journal of Business and Management*, 12(27), 93-99.
- Akenga, G. (2017). Effect of Liquidity on Financial Performance of Firms Listed at the Nairobi Securities Exchange, Kenya. *International Journal of Science and Research (IJSR)*, 6(7), 279–285. <https://doi.org/10.21275/art20175036>.

- Avlonitis, G. J., & Salavou, H. E. (2007). Entrepreneurial orientation of Small Enterprises, product innovativeness, and performance. *Journal of Business Research*, 60(5), 566-575.
- Besley, S. & Brigham, E. (2005). *Essentials of managerial finance*. (13th ed.) Thomson Southwestern, Inc.
- Bhunia, A. (2010). A trend analysis of liquidity management efficiency in selected private sector Indian steel industry, *International Journal of Research in Commerce and Management*, 1(5), 213.
- Calistus, W.W., Mohamed, S.M. & David, O. (2018). Effect of liquidity on financial performance of the sugar industry in Kenya. *International Journal of Education and Research*, 6(6), 29-44.
- Ciprian, C. & Maria, C. (2018). Cash conversion cycle and corporate performance: Evidence from Romania. *Annual Session of Scientific Papers IMT ORADEA*, 184, 1-4.
- Dahiyat, A.A., Weshah, S.R. & Aldahuyat, M. (2021). Liquidity and solvency management and its impact on financial performance: Empirical evidence from Jordan. *Journal of Asian Finance, Economics and Business*, 8(5), 135-141.
- Dixit, P. (2015). Working capital management in selected it Companies. *Available at SSRN 2544860*.
- Durah, O., Abdul Rahman, A., Jamil, S.A. & Ghafeer, N.A. (2016). Exploring the relationship between liquidity ratios and indicators of financial performance: An analytical study on food industrial companies listed in Amman Bursa. ***International Journal of Economics and Financial Issues*, 6(2), 435-441.**
- Ejelly, A. M. (2004). Liquidity-Profitability tradeoff: An empirical investigation in an emerging market. *International Journal of Commerce and Management*. 14(2), 48-61.
- Falope, O. I. and Ajilore, O. T. (2009). Working capital management and corporate profitability: evidence from panel data analysis of selected quoted companies in Nigeria. *Research Journal of Business Management*, 2(3), 73-84.
- GARP. (2015). *Asset and liability management* (2nd ed.).
- Gibson, C. (2009), *Financial reporting and analysis*. (11 ed.). Mason, OH, México: Cengage
- Greene, W. H. (2008). *Econometrics analysis* (6th ed.) New Jersey: Prentice Hall.
- Horne, J. C. & Wachowicz, J. M (2004). *Fundamentals of financial management*. New York NY: Prentice-Hall publishers.
- Hutchison, P. D., Farris II, M. T. and Andres, S. B. (2007), Cash-to-cash analysis and management. *The CPA Journal*, 77(8), 42-47.
- Jose, M. L., Lancaster, C., & Stevens, J. L. (1996). Corporate returns and cash conversion cycles. *Journal of Economics and finance*, 20(1), 33-46.
- Maness, T. S., & Zietlow, J. T. (2005). *Short-Term financial management* (3rd ed.), Ohio: South-Western/Thomson Learning.
- Mohammed, A.F.A. (2020). The impact of working capital management on financial performance: Evidence from Jordan. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 10(1), 308-315.
- Mugo, A. N. (2016). *Challenges facing Kenyan Micro and Small Enterprises in accessing East African Markets: A case of manufacturing MSEs in Nairobi* (Doctoral dissertation, United States International University-Africa).
- Mwirigi D., Hannah, W.W., & Mary, M. (2018). The Effect of Working Capital Management on Performance of Small Enterprises in Kenya. *International Journal of Managerial Studies and Research (IJMSR)*, 6(12), 1-9.
- Napompech, K. (2012). Effects of working capital management on the profitability of Thai listed firms. *International Journal of Trade, Economics and Finance*, 3(3), 227.
- Nazish, B. & Shehla, A. (2017). The relationship between liquidity and firms' profitability: A case study of Karachi Stock Exchange. *Asian Journal of Finance & Accounting*, 9(1), 54-67
- Nthiwa, J. M., Nzioki, P. M., RiwoAbudho, M., & Kimeli, S. K. (2013). Management of working capital and its effect on profitability of manufacturing companies listed on Nairobi securities exchange (NSE), Kenya.
- Obalemo, A.O., Opusunji, M.I., & Jiya, N.S. (2020). Effect of cash conversion cycle (ccc) period on the profitability of selected food and beverage companies in Nigeria. *International Journal of Management Studies and Social Science Research*, 2, 108-116.

- Ogungbade, O.I., Adekoya, A.C. & Akeredolu, O. (2020). Liquidity and performance of listed manufacturing companies in Nigeria. *International Journal of Economics, Commerce and Management*, 8(11), 26-41.
- Oladipo, O. N., Adegboyo, O. S., & Olugbamiye, D. O. (2020). Effects of working capital management on profitability of manufacturing firms in Nigeria. *Journal of Accounting and Management (JAM)*. 10(3), 2284-9459
- Onodje, M.A. (2014), Working capital management and performance of selected Nigerian manufacturing companies, *Global Journal of Management and Business Research*, 14(3), 2249 – 4588.
- Padachi, K. (2006). Trends in working capital management and its impact on firms' performance: An analysis of Mauritian small manufacturing firms. *International Review of Business Research*, 2(2), 45-58.
- Padachi, K. (2006). Trends in working capital management and its impact on firms' performance: An analysis of Mauritian small manufacturing firms. *International Review of Business Research*, 2(2), 45-58.
- Pandey, I. (2004). *Financial Management*; New Delhi – 110014: Vikas publishing house Pvt.Ltd. 10-14
- Pandey, I.M. (2005). *Financial Management* (9th ed.), Vikas Publishing House, PVT Ltd., New Delhi.
- Raheman, A. & Nasr, M. (2007). Working capital management and profitability: Case of Pakistani Firms, *International Review of Business Research Papers*, 3(1), 279- 300.
- Robinson, T., Henry, E., Pirie, W., Broihahn, M. (2015). *International financial statement analysis*, (3rd ed.) New Jersey: John Wiley & Sons, Inc.
- Samiloglu, F., & Demirgunes, K. (2008). The effect of working capital management on firm profitability: Evidence from Turkey. *The International Journal of Applied Economics and Finance*, (2), 44-50.
- Samsonowa, T. (2012). *Industrial research performance management*. Verlag Springer, Berlin. <https://doi.org/10.1007/978-3-7908-2762-0>.
- Sathyamoorthi & Wally-Dima, (2018). Annual session of scientific section management and economics in engineering. <https://doi.org/10.1051/mateconf/201818404009>
- Sinha, G. (2012). In: Ghosh AK, editor. *Financial Statement Analysis. Eastern Economy Edition*, Prentice Hall of India Private Limited, New York.
- Taulia (n,d) What is working capital management, <https://taulia.com/glossary> .
- Yucel, T., & Kurt, G. (2002). Cash conversion cycle, cash management and profitability: An empirical study on the ISE traded companies. *The ISE Review*, 6(22), 1-15.
- Yusuf Aminu and Nasruddin Zainudin (2015). A Review of Anatomy of Working Capital Management Theories and the Relevant Linkages to Working Capital Components: *European Journal of Business and Management* www.iiste.org Vol.7, No.2.

Appendix

	Pooled regression		Random effect		Fixed effect	
	Coeff value	P-	Coeff	P-value	Coeff value	P-
APP_{it}	-8.96E-05	(0.7207)	0.0032135	(0.8490)	0.00979	(0.7530)
CCC_{it}	0.011112	(0.7638)	0.1221847	(0.0450)	0.34535	(0.0010)
LIQ_{it}	43.18790	(0.1810)	-0.0123222	(0.6730)	-0.00167	(0.9950)
CONST	2982.844	(0.0023)	-2.166569	(0.0290)	-6.46024	(0.0000)
R ²	0.004856		0.00075		0.0108	
N	285		285		285	
F*	0.564100	(0.727569)	0.876532	(0.4964)	3.58	(0.0038)
Corr (U _i ,X)	0		0		-0.6630	
Lagrangian	20.30	(p-value = 0.000)				
Multiplier test						
Hausman Test			55.59	(P-value 0.0000)		