



Working Capital Management and Financial Performance of Listed Manufacturing Firms in Nigeria

Adeyefa, Felix Ademola, PhD¹, Adeyefa, Oluwafunmilayo Adeuti²

¹Department of Accountancy, Rufus Giwa Polytechnic, Owo, Ondo State, Nigeria

²Department of Insurance and Risk Management, Rufus Giwa Polytechnic, Owo, Ondo State, Nigeria

ABSTRACT

Working capital is a critical part of an investment because it is impossible for an organisation to run without funds. However, there were so many challenges faced by manufacturing firms in managing their working capital, which had made it difficult for manufacturing firms to make adequate profit. This study investigated the effect of working capital management on the financial performance of listed manufacturing firms in Nigeria. Eight listed manufacturing firms were randomly selected and data were sourced from the Audited Annual report of the firms in Nigeria from 2015 to 2020. The formulated hypotheses were tested with the aid of panel unit root test, Kao residual panel co-integration and Ordinary Least Square (OLS) panel data regression. Findings from the study revealed that cash conversion period, accounts receivable days, debt repayment period and current ratio have negative and significant effect on the financial performance of listed manufacturing firms. The study recommended that working capital components be properly assessed by finance managers, and that any subsequent policies should ensure that the cash conversion cycle is drastically decreased to increase profitability. Also, accounts receivable days should not be excessively long to prevent the time it takes a customer to pay a business for the goods or services they purchased from being unnecessarily extended, the debt repayment period should also be extended to allow for a longer period of repayment, higher amount of loans, and low interest.

Keywords: Financial performance, current ratio, account receivables, working capital, debt repayment.

INTRODUCTION

For a firm to perform effectively, its working capital should be adequately managed. A well-managed working capital enables the firm to meet its financial obligations. Working capital refers to the resources required for a company's daily production of goods to be sold by the company. It is also described as the investments in assets anticipated to be realised in the year's trading. It is simply the excess of a company's current assets over its current liabilities (Oye, 2014). Working capital is vital because it enables businesses to run their daily operations and make crucial investment decisions without running out of funds or experiencing liquidity problems. A firm must manage its working capital effectively to boost its financial performance (Smith, 1973; Shin & Soenen, 1998).

Working capital management is crucial since it significantly affects a company's financial performance (Deloof, 2003). Inefficient working capital management could lead to a firm experiencing not just a decline in profitability but a financial crisis (Mansoori & Muhammad, 2012). Thus, the main challenge is how businesses should manage their working capital so that it will ultimately enhance solvency. The management of any establishment should adequately monitor the components of working capital to reduce risk and ensure improvement in firms' financial performance (Meryem, 2011). The components of working capital are account receivable (debtors), stock, accounts payable (creditors) and cash, which are needed for a firm's day-to-day manufacturing and business transactions.

Each working capital component should be monitored to guide against insolvency; account receivable are customers' outstanding balances for goods or services for which an invoice has been issued, which could be measured with account receivable days. Firms should make policies on the number of days it takes to pay back outstanding customers' invoices and it should be noted that more extended accounts receivable days may be detrimental to the performance of any business. Debtors should be encouraged to settle their bills before the due dates by offering them payment incentives and discounts. Account payable is another component of working capital that shows the days a business pays its supplier or creditor. The debt repayment period calculates how long a company will take to pay back a loan in full. Long-term loans are naturally preferable to short-term loans since they offer higher loan amounts, more extended repayment periods and lower interest rates.

The firm's inventory is another component that should be considered; the cash conversion cycle (CCC) measures the number of days the firm's inventories are converted into cash from sales. A shorter cash conversion cycle (CCC) improved firms' profitability (Jose, M. L., Lancaster, C., & Stevens, J. L. (1996), Wang, 2002, Raheman and Nasr, 2007 and Lee (2015). Cash is another significant component of working capital that any business cannot underestimate since no company can survive without enough cash; the critical factor to the success of any business venture depends on how management plans and manages the business's cashflows. Therefore, cash management in any organisation is germane (Akinsulire, 2003; Akinyomi & Tasie, 2011).

The more cash in hand, the easier it is for a firm to meet up with the settlement of its bills. In managing cash, firms must strike a balance between liquidity and profitability to ensure that the business remains solvent (Eljelly (2004), Kesseven, 2006; Kargar & Bluementhal, 1994).

The manufacturing sector is the heart of any economy; the industry plays a vital role in economic growth (Rafiq, 2017). In the United Kingdom, the manufacturing sector contributes about 10% to the economy's total output and employs about a 2.6million people. The sector also contributes up to 44% of all the exports in the United Kingdom (Martyn, 2022). Also, the manufacturing sector contributes 10.8% of the total gross domestic product in the United States of America. In contrast, in South Africa, manufacturing firms contribute 11.7% of the total gross domestic product. The manufacturing sector's contribution to the gross domestic product in Nigeria is 9.06% (World Bank, 2022).

The manufacturing sector in Nigeria is tagged as underperforming with its contribution of under 10% to the Nigerian economy (Adekoya, 2020). The manufacturing sector in Nigeria is characterised by a lack of sufficient funds, late payment by debtors (debt repayment period), infrastructural challenges, inadequate raw material (stock) and political instability. The failure of manufacturing firms in Nigeria may not be far-fetched from these firms' inability to adequately manage their firms' working capital (Olaoye & Adeboboye, 2019). This study, therefore, investigates the likely reasons for the underperformance of the manufacturing sector in Nigeria as it relates to how manufacturing firms make policies regarding their debt repayment period, account receivables, accounts payable and cash management.

1.1 Objectives of the study

The general objective of the study is to examine working capital management and the performance of listed manufacturing firms in Nigeria. The specific objectives are to:

- i. examine the effect of cash conversion cycle on profitability of listed manufacturing firms in Nigeria.
- ii. determine the effect of cash collection policy on profitability of listed manufacturing firms in Nigeria
- iii. examine the effect of debt repayment period on profitability of listed manufacturing firms in Nigeria
- iv. ascertain if liquidity ratio has significant effect on profitability of listed manufacturing firms in Nigeria.

LITERATURE REVIEW

2.1 Conceptual framework

2.1.1 Working capital and its effect on firm's financial performance

i. Cash conversion cycle

The cash conversion cycle. The cash conversion cycle (CCC) measures the time required for the company to clear out its stored inventory, turn its outstanding accounts receivables balance into cash, and how long the payment date to suppliers for goods and services received can be pushed out. The cash conversion cycle uses average timeframes to pay suppliers, assemble inventory, market goods, and collect payments from customers. It affects the profitability of the company positively if the timeframe is short. A longer cash conversion cycle will have an adverse effect on the financial performance of firms. Cash conversion cycle is calculated as:

Cash conversion cycle = Average account receivables + Average inventories – Average accounts payable.

ii. Accounts receivable days

Accounts receivable days are the amount of time it takes a consumer to repay a company for goods or services purchased. Accounts receivable days ratio assesses how successful a company is at obtaining short-term payment. Both payment terms and accounts receivable days differ from one firm to another. If account receivable days are too close to the specified payment terms, then the firm's credit policy is too harsh and that will have an adverse effect on the revenue generation of the company. Accounts receivable days is calculated as:

Accounts Receivable Days = (Accounts Receivable / Revenue) x 365

iii. Debt repayment period

Repayment refers to the act of returning money that has been borrowed from a lender through installment payments that comprise both principal and interest. Borrowers must pay interest for the right to utilize the money released due to the loan. There is a repayment plan when credit is given, and the payment is adjusted to allow for the repayment of the loan gradually over its term. Debt repayment period refers to the time that payments must be made to repay a loan fully. Debt repayment period is calculated as:

Debt repayment period = (Average account payables days/cost of sales) x 365 days

iv. Current ratio

Current ratio is one type of liquidity ratio that measures a company's ability to meet short-term financial obligations. The current ratio indicates the capacity of a company to repay short-term loans due within the financial year. The ratio shows a company's financial standing and how to make the most

of its current assets' liquidity to pay off debt and other obligations. The historical performance of a company determines a good current ratio. A company is liquid and has enough cash to meet its liabilities if the current ratio is 1.5 and above. If the current ratio falls below 1, the company's current liabilities exceed its current asset. A good current ratio should be above 1, while the optimum range is between 1.5 and 2. A company with a current ratio of 2 can easily pay off its debt twice. A ratio greater than 1 denotes the company's financial health.

Current ratio = current assets / current liabilities

2.2 Theoretical Review

2.2.1 The Cash Conversion Cycle (CCC) Theory

The theory of cash conversion cycle simply explains the period between a financial outlay and a cash recovery (Siddiquee, Khan, Shaem & Mahmud, 2009). According to the theory, it takes a business how long to turn its resource inputs into cash. The theory assesses the efficiency with which a company manages its working capital. The cash conversion cycle is the period required or taken by a business to convert cash from investments in production and sales.

Cash conversion cycle (CCC) is one of the criteria used to evaluate how effectively management uses working capital. It uses average timeframes to pay suppliers, makes inventories, sells goods, and collect payments from customers. The cycle calculates how long a corporation takes to turn cash losses into cash inflows and, consequently, how many days of funding are needed to cover current obligations and maintain operations. Cash conversion cycle can be shortened by accelerating customer payments and delaying supplier payments: the shorter this period, the better for the business. Firms should have a short cash conversion cycle that will boost profitability.

A business is generally considered healthier when its cash conversion cycle is lower. Businesses strive to shorten the cash conversion cycle by expediting customer payments while delaying supplier payments. For instance, if the business is well-positioned in the market and has control over the terms of its supplier contracts, the cash conversion cycle can even be negative (Brennan, 2003). The cash conversion cycle of firms differs depending on the firm's size.

2.2.2 Resource-based theory

The resource-based theory is an organisational framework that helps identify the strategic resources that a company can use to gain a long-term competitive advantage. The resource-based theory holds that businesses should examine their operations to identify potential sources of competitive advantage that can be exploited. According to the theory, having resources is advantageous, difficult to duplicate, uncommon, and incomparable (Barney, 2001). In recent years, the resource-based theory has developed to offer a means of comprehending how strategic resources and competencies enable organizations to achieve outstanding performance.

It is pertinent to distinguish between the term 'resources' and 'strategic resources'. The resource-based theory emphasises using strategic resources to achieve companies' organisational goals. Resources like cash, plant and machinery, buildings and other tangible assets are common and not considered strategic resources. Strategic resources are intangible resources that include special skills, knowledge, policies, and the company's reputation to establish a sustainable competitive edge. Therefore, Finance Managers should prioritise cultivating and building their companies' intangible resources if they want long-term competitive advantages.

2.3 Empirical Review

Bellouma (2010) examined working capital management on corporate profitability of firms in Kenya between 1993 and 2008 using ordinary least square estimation techniques. The study discovered that working capital has a negative effect on a firm's performance and that the average payment period significantly positively impacts the performance of firms in Kenya. Kulkanya (2005) investigated the effect of working capital management on firm's performance of listed companies on Thailand stock exchange from 2007 to 2009. The study used the ordinary least square regression to analyse the data and findings showed that inventory conversions period and receivables collection negatively impact gross operating profit.

Niresh (2012) examined working capital management and financial performance of manufacturing sectors in Sri Lanka from 2007 to 2012. The study used correlation and regression analysis to test the formulated hypotheses and the result revealed no significant relationship between cash conversion cycle and performance measures. Akoto, Awunyo and Angmor (2015) investigated the relationship between working capital management practices and profitability of listed manufacturing firms in Ghana from 2005 to 2009. The study used panel data to analyse the data and found a significant negative relationship between profitability and accounts receivable days. The firm's cash conversion cycle, current assets ratio, size, and current asset turnover significantly positively influence the profitability of listed manufacturing firms.

Alimazari (2013) investigated the relationship between working capital management and the firm profitability of Cement Manufacturing Companies in Saudi Arabia. The study used 8 Saudi Cement Manufacturing Companies listed on the Saudi Stock Exchange from 2008 to 2012. The study made use of Pearson Bivariate correlation and regression analysis. The study showed that Saudi cement industry's current ratio significantly affected profitability and that the firm's size increased profitability. Gakure, Cheluget, Onyango and Keraro (2012) examined the relationship between working capital management and manufacturing firms' performance on the Nairobi Stock Exchange from 2006 to 2010. The study used secondary data from a sample of 18 companies on the Nairobi Stock Exchange. The result showed that a strong negative coefficient relationship exists between firm's performance and liquidity of the firms.

Mabandla (2018) investigated the relationship between working capital management and financial performance of listed goods and beverages companies in South Africa from 2007 to 2016. The study used OLS multiple regression analysis to test the formulated hypotheses. The study found that adopting aggressive working capital management helps increase the company's financial performance and shareholder wealth. Rahaman, Afza, Qayyum and Bodla (2010) investigated the manufacturing sector's working capital and corporate performance in Pakistan. The study covered the period between 1998 and 2007. The study made use of balanced panel data, and the result indicated that cash conversion cycle, net trade cycle and inventory turnover in days significantly affected the firm's financial leverage performance, and sales growth and firm size also had a significant effect on the firm profitability.

Melita, Maria and Petros (2016) examined the effect of working capital management on financial performance of firms in a developing economy. Data were obtained from firms on Cyprus Stock Exchange from 1998 to 2007. The study used multivariate regression analysis to test the hypotheses and discovered that cash conversion cycle, days sales outstanding, creditors payment period and days in inventory have a relationship with the firm's profitability. Deloof (2007) investigated the relationship between working capital management and corporate profitability in Belgium. The study sampled 1,009 large non-financial firms in Belgium from 1992 to 1996. Findings from the study showed that managers could boost business profitability by cutting the number of days that inventories and accounts receivable are outstanding, as well as how long less profitable companies take to pay their debts. The study also found that managers can boost business profitability by cutting the number of days that inventories and accounts receivable are outstanding and how long less profitable companies take to pay their debts.

Several studies were carried out in Nigeria; Mike (2014) examined the internal financial activity of working capital management and the performance of Nigerian manufacturing companies. The study gathered data covering 2002 to 2011 tested with ordinary least square regression analysis and found that the receivable conversion period positively affects manufacturing performance while debt-equity ratio and cash conversion cycle negatively affect manufacturing performance. Falope and Ajilore (2009), investigated the impact of working capital management on corporate profitability of non-financial service companies quoted on the Nigeria Stock Exchange (NSE). The study found a dependent negative relationship between net operating profit and cash conversion cycle, average payment period, inventory turnover and average collection period. The study also found that firm size does not affect financial performance.

Ogundipe, Idowu and Ogundipe (2012) examined working capital management, firm performance and market value in Nigeria. The data obtained from 1999 to 2012 was evaluated with regression analysis method. The study revealed a significant negative relationship between cash conversion cycle and market valuation and firm performances in Nigeria. Angabor and Alematu (2014) investigated the effect of working capital and the profit performance of the Nigeria cement sub-sector from 2002 to 2009. The study made use of descriptive statistics and multiple regression analysis. The finding showed a non-significant negative effect of some days' account receivables being outstanding on firm profitability. It also revealed a significant positive effect of cash conversion cycle on the profit performance are the selected firms.

Oladipupo and Oluwadare (2019) investigated working capital management's effect on Nigerian Breweries Plc's financial performance from 2011 to 2016. The study used descriptive and inferential statistics to analyse the data and the result showed that cash conversion cycle had a negative and significant relationship with the return on assets (ROA). The study also confirmed a negative but insignificant relationship between return on assets, creditor conversion period and inventory conversion period. Ajayi, Abogun and Taiwo (2017) examined the impact of working capital on the financial performance of listed consumer goods manufacturing firms in Nigeria for ten years from 2005 to 2015. The study employed descriptive statistics to analyse the data obtained and found that efficient working capital management has a positive impact on the financial performance of manufacturing firms in Nigeria.

Madugba and Ogbonnaya (2016) examined the impact of working capital management on the financial performance of manufacturing companies in Nigeria covering the period of 2000 to 2013 using OLS multiple regressions. The study found that the average payment period and average convention period impact businesses per share and return on capital employed. Kajola, Nwaobia and Adedeji (2014) examined the impact of working capital management on firms' financial performance in Nigeria. The study sampled thirty listed manufacturing firms from 2004 to 2010 with the use of Panel data methodology to estimate the coefficients of the explanatory variables. Findings from the study revealed that the working cash conversion cycle has a negative and significant relationship with the financial performance of firms. Thus, efficient management of working capital items would bring about an increase in the profitability level of firms. Our findings are consistent with prior empirical studies and finance theory.

Akindele and Odusina (2015) examined the relationship between working capital management and firms' profitability. Data were obtained from the audited financial statements of twenty-five Nigerian listed companies from 2005 to 2011. The study used multiple regression analysis to analyse the data, and the findings showed a negative relationship between the working cash conversion cycle and the firm's profitability. Ogbuji and Ogunyomi (2014) examined the effect of working capital management policy and financial performance in the Nigerian Foods and Beverages Industry. The study obtained data from Nestle Nigeria Plc from 2008 to 2012. The study made use of accounting ratios, descriptive analysis and simple correlation analysis to analyse the data gathered. The study found that a negative and significant relationship exists between working capital management and profitability. In contrast, an insignificant negative relationship exists between working capital management and liquidity performance of Nestle Nigeria Plc.

Udenwa, Abdullahi and Okoli (2020) investigated the effect of working capital management on the market value of quoted food and beverages manufacturing firms in Nigeria from 2008 to 2017. The data obtained for the study are descriptive statistics and multiple regression analysis. The independent variables are current ratio, quick ratio and cash conversion cycle while the explanatory variables are market capitalisation. The results revealed that cash conversion cycle negatively and significantly affected the market value of food and beverages manufacturing firms in Nigeria. Findings further showed that current ratio related positively but insignificantly with market capitalisation while quick ratio related positively but insignificantly with market capitalisation of food and beverages companies in Nigeria.

2.4 Gaps in Literature

Literature has been reviewed on developed, developing and Nigeria on the relationships that actually exist between working capital and financial performance of listed manufacturing firms. From the existing literature, it is clear that findings from previous authors produced conflicting results on the subject matter, while some found positive relationships between working capital and financial performance of listed manufacturing firms (Akinyomi, 2014; Hassan, Nberia & Muturi, 2017), some authors discovered negative relationships (Kajola, Nwaobia & Adedeji, 2014; Mawutor (2014); Akindele & Odusina, 2015; Udenwa, Akindele & Odusina, 2015; Abdullahi & Okoli, 2020).

From the aforementioned, it can be seen that authors have provided contradictory or disparate empirical evidences on the effect of working capital management on the financial performance of listed manufacturing enterprises in Nigeria. These contradictory findings raised questions about the actual nexus between working capital management and financial performance of listed manufacturing enterprises in Nigeria. These controversies created a research gap to be filled. Hence, the need for fresh research to provide more verifiable evidences on the subject matter.

Furthermore, previous authors created a research gap in their studies, having failed to hinge their studies on related finance theory. This study departs from others by employing the Resource-Based theory as the theory underpinning the study. According to the resource-based approach, firms can increase their profitability by using strategic resources.

3. METHODOLOGY

3.1 Sources of Data

The study made use of secondary data which was extracted from audited annual reports of eight (8) manufacturing firms in Nigeria (Nestle Nigeria Plc, Unilever Nigeria Plc, Cadbury Nigeria Plc, Dangote Nigeria Plc, Coca-Cola Nigeria Plc, Guinness Nigeria Plc, Lafarge Nigeria Plc and Conoil Nigeria Plc.) over six years (6) from 2015 to 2020.

3.2 Method of data analysis

The study used descriptive statistics, correlation analysis and random effect panel data regression analysis to test the formulated hypotheses.

3.3 Model Specification

The study is hinged on the Resource-based theory, which is concerned with using strategic resources to accomplish firm's profitability. The model for the study was modified based on the views of Padachi (2006) and Raheman and Nasir (2007) are stated as follows:

$$ROA_{it} = f(CCC_{it}, ARD_{it}, DRP_{it}, CRT_{it}) \dots\dots\dots(i)$$

Equation (i) above can be written in an explicit form as:

$$ROA_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 ARD_{it} + \beta_3 DRP_{it} + \beta_4 CRT_{it} + \mu_t \dots\dots\dots(ii)$$

Where:

- ROA_{it} = Return on Asset of firm i for time period t (proxy for profitability)
- CCC_{it} = Cash conversion cycle of firm i for time period t (proxy for stock)
- ARD_{it} = Account receivable days of firm i for time period t (proxy for debtor)
- DRP_{it} = Debt repayment period of firm i for time period t (proxy for creditor)
- CRT_{it} = Current ratio of firm i for time period t (proxy for cash/liquidity)
- μ_t = Error term
- i = Selected company
- t = Time series

β₁, β₂, β₃, β₄, β₅ - parameters to be estimated

4. DATA PRESENTATION AND ANALYSIS OF RESULTS

4.1 Descriptive Statistics

The data used for this study include returns on asset (ROA), account receivable days (ARD), debt repayment period (DRP), cash conversion cycle (CCC) and current ratio (CRT) for each of Nestle Nigeria Plc, Unilever Nigeria Plc, Dangote Nigeria Plc, Cadbury Nig. Ltd, Coca Cola Plc, Guinness Plc and Larfage manufacturing company from 2015 to 2020.

Group Summary Statistics

The summary statistics of these variables are provided in Table 4.1 showing the averages and medians, along with maximum and minimum values recorded for the period.

Table 4.1: Summary Statistics of the Variables

	ARD	CCC	CRT	DRP	ROA
Mean	30.81250	-26.04167	1.067794	87.20833	7.197917
Median	26.50000	-24.00000	0.983071	81.50000	4.250000
Maximum	130.0000	22.00000	2.451505	151.0000	26.00000
Minimum	4.000000	-96.00000	0.439034	13.00000	0.300000
Std. Dev.	23.05189	29.93465	0.422909	28.56866	6.864571
Skewness	2.068038	-0.616870	1.381945	0.200346	1.359349
Kurtosis	9.061487	3.087598	5.454296	2.969946	3.812110
Jarque-Bera	107.6975	3.059573	27.32530	0.322915	16.10167
Probability	0.000000	0.216582	0.000001	0.850903	0.000319
Sum	1479.000	-1250.000	51.25409	4186.000	345.5000
Observation	48	48	48	48	48

Source: E-view result from annual financial statement of selected manufacturing companies for the respective years

The result shows that the average number of days a customer invoice is outstanding before it is collected for the eight manufacturing companies is 30.8days for the period under consideration but is also as low as four days. The result further shows that the average number of days it takes the eight manufacturing companies to convert their products into cash is 26days and this is as high as 22days while it is as low as 96days. The implication is that even before the goods are produced, many wholesalers have already paid for them.

The result shows that on average, the rate at which the current assets offset the current liability of the firm is 1.08, while it is very high up to 2.45 and this is as low as 0.44. However, the acid test ratio is averaged 0.75; this is as high as 2.14 and low up to 0.22. The average return on assets for the eight manufacturing companies is 7.2%, which is as high as 26% but was worsened up to 0.3%. The Jarque-Bera probability shows that the distribution is not normally distributed as the probability is less than 5% for account receivable days, current ratio, quick ratio and returns on assets. However, the variables, cash conversion period and debt repayment period, are normally distributed as their probabilities are greater than 5%.

4.2 Correlation Test

This section examines the degree of relationship among the variables. The correlation test was conducted for the variables under consideration to ensure no perfect positive or negative relationship among variables employed to prevent multicollinearity associated with a regression result.

Table 4.2: Correlation Test

Variable	ARD	CCC	CRT	DRP
ARD	1.00	0.42	0.51	-0.12
CCP		1.00	0.48	-0.80
CRT			1.00	-0.23
DRP				1.00

Source: E-view result from annual financial statement of selected manufacturing companies for the respective years

From Table 4.2, it can be seen that there is no perfect positive or negative correlation associated with the regression result as the highest degree of relationship associated among variables is 0.85; this is between current ratio and quick ratio and the relationship is as expected. Thus, it is concluded that no high degree of multicollinearity is associated with the regression result.

4.3 Data Analysis

4.3.1 Hausman Test

The Hausman test is designed to detect violations of the random effects modelling assumption that the explanatory variables are orthogonal to the unit effects. The Hausman test statistic H measures the difference between the two estimates. Under the null hypothesis of orthogonality, H is distributed chi-square with degrees of freedom equal to the number of regressors in the model. A finding that $p < 0.05$ is taken as evidence that, at conventional levels of significance, the two models are different enough to reject the null hypothesis and hence to reject the random effects model in favour of the fixed effects model.

If the Hausman test does not indicate a significant difference ($p > 0.05$), however, it does not necessarily follow that the random effects estimator is "safely" free from bias and therefore, to be preferred over the fixed effects estimator. In most applications, the true correlation between the covariates and unit effects is not precisely zero. Thus, if the Hausman test fails to reject the null hypothesis, it is likely not because the true correlation is zero and the random effects estimator is unbiased. Instead, the test does not have sufficient statistical power to detect departures from the null.

Table 4.3 Hausman test result

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	5.055336	5	0.4092

Source: E-view result from annual financial statement of selected manufacturing companies for the respective years

From the result in Table 4.3, the chi-square probability is 0.4092, greater than 5%. This means we fail to reject the null hypothesis and conclude that the random effect estimation is good and the fixed effect is not. Hence, we reject the fixed effects model in favour of the random effects model.

4.3.2 Panel Unit Root Test

The study deploys Newey-West automatic bandwidth selection, PP - Fisher Chi-square and PP - Choi Z-stat test to examine the stationarity of the panel series and test the null hypothesis of unit root. It is expected that the series do not contain unit roots in order to find relationships among the variables in the long run. The test was carried out at level and first difference using Automatic lag length selection based on asymptotic Chi-square distribution. The variables of Returns on Asset (ROA), Account Receivable Days (ARD), Debt Repayment Period (DRP), Cash Conversion cycle (CCC) and Current Ratio (CRT) for each of Nestle Nigeria Plc, Unilever Nigeria Plc, Cadbury Nigeria Plc, Dangote Nigeria Plc, Coca-Cola Nigeria Plc, Guinness Nigeria Plc, Lafarge Nigeria Plc and Conoil Nigeria Plc were tested. The levels of statistics of the tests are reported in Table 4.4.

Table 4.4: Panel Unit Root Result Test at level

Variable	PP – F. chisq-stat.	Prob.	PP - Choi Z-stat	Prob.	PP – F. chisq-stat.	Prob.	PP - Choi Z-stat	Prob.	Desn
ARD	32.78	0.008	-2.60	0.005	-	-	-	-	I(0)
CCC	20.55	0.197	-0.95	0.170	33.98	0.006	-1.84	0.03	I(1)
CRT	27.40	0.037	-0.13	0.450	42.78	0.000	-3.44	0.00	I(1)
DRP	27.28	0.038	-1.30	0.096	26.21	0.005	-1.76	0.04	I(1)
ROA	21.05	0.177	-1.04	0.149	31.10	0.013	-2.11	0.02	I(1)

Source: E-view result from annual financial statement of selected manufacturing companies for the respective years

From Table 4.4, the PP - Fisher Chi-square and PP - Choi Z-stat reported all the variables to be stationary at level except account receivable days.

4.3.3 Kao Residual Panel Co-Integration Test

The Kao Residual co-integration test is carried out to test the long-term co-movement among the economic variables. Before any useful conclusion can be made regarding relationships between the series, it is important that co-integration first exists.

Table 4.5: Co-integration Result

Series: ROA CCC ARD DRP CRT				
Null Hypothesis: No cointegration				
Trend assumption: No deterministic trend				
			t-Statistic	Prob.
ADF			-3.504595	0.0002
Residual variance			20.63030	
HAC variance			12.44061	

Source: E-view result from annual financial statement of selected manufacturing companies for the respective years

In Table 4.5, the result shows that at 5% critical value, co-integrating vector exists among the economic fundamentals. The null hypothesis of no co-integration among the panel series cannot be accepted by this finding. Hence, the variables are interrelated with each other in the long run, that is, they could move together on the long-run growth path, and their existing relationships are not spurious.

4.3.4 Test of Hypotheses

Table 4.6: Random Effect Panel Data Regression

Dependent Variable: Returns on Asset (ROA)

Periods included: 6

Cross-sections included: 8

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CCC	-0.033514	0.005046	-6.641938	0.0000
ARD	-0.032090	0.005445	-5.893243	0.0000
DRP	-0.035829	0.009663	-3.707988	0.0029
CRT	-0.617019	0.284437	-2.169267	0.0464
C	10.88552	4.543803	2.395685	0.0211

Effects Specification		S.D.	Rho
Cross-section random		7.496672	0.8035
Idiosyncratic random		3.707552	0.1965

Weighted Statistics			
R-squared	0.917434	Mean dependent var	1.424537
Adjusted R-squared	0.812367	S.D. dependent var	3.733149
S.E. of regression	3.709994	Sum squared resid	578.0902
F-statistic	15.17705	Durbin-Watson stat	1.861764
Prob(F-statistic)	0.005722		

Source: E-view result from Annual financial statement of selected manufacturing companies for the respective years

Test of Hypothesis One

H₀: Cash conversion cycle has no significant effect on the profitability of listed manufacturing firms in Nigeria.

Decision Rule: Reject the null hypothesis (H_0) at 5% level of significance if the probability of the coefficient of cash conversion cycle in Table 4.6 is statistically significant at 5%; otherwise, we fail to reject the null hypothesis. The hypothesis is rejected because the probability value of the coefficient of cash conversion period in Table 4.6 is less than 5% making the coefficient statistically significant. Thus, the null hypothesis is rejected and it is concluded that cash conversion period has a significant negative relationship with the profitability of listed manufacturing firms in Nigeria. It should also be noted that cash conversion period has a negative and statistically significant impact on the returns on asset.

Test of Hypothesis Two

H₀: Account receivable days have no significant effect on the profitability of listed manufacturing firms in Nigeria.

Decision Rule: Reject the null hypothesis (H_0) at 5% level of significance if the probability of the coefficient of account receivable days in Table 4.6 is statistically significant at 5%, otherwise, we fail to reject the null hypothesis. The null hypothesis is rejected because the probability value of the coefficient of account receivable days in Table 4.6 is less than 5%, making the coefficient statistically significant and thus, we reject the null hypothesis and conclude that account receivable days have negative and significant effect on the returns on asset.

Test of Hypothesis Three

H₀: Debt repayment period has no significant effect on profitability of listed manufacturing firms in Nigeria.

Decision Rule: Reject the null hypothesis (H_0) at 5% level of significance if the probability of the coefficient of Debt repayment period in Table 4.6 is statistically significant at 5%, otherwise, we fail to reject the null hypothesis. The hypothesis is rejected because the probability value of the coefficient of Debt repayment period in Table 4.6 is less than 5% making the coefficient statistically significant and thus, we reject the null hypothesis and conclude that Debt repayment period has a negative and significant impact on the returns on asset.

Test of Hypothesis Four

H₀: What is the effect of liquidity ratio on the profitability of listed manufacturing firms in Nigeria?

Decision Rule: Reject the null hypothesis (H_0) at 5% level of significance if the probability of the coefficient of current ratio, as shown in Table 4.6 is statistically significant at 5%, otherwise, we fail to reject the null hypothesis. The null hypothesis is not rejected because the probability value of the

coefficient of current ratio is less than 5%. Current ratio has a negative and significant impact on return on assets. Thus, it is concluded that liquidity ratio significantly positively affects the profitability of listed manufacturing firms in Nigeria.

4.4 Discussion of Findings

It is concluded from Table 4.6 that about 91.7% of variations in returns on asset is explained by all the explanatory variables (account receivable days, debt repayment period, cash conversion cycle and current ratio). Thus, it is concluded that a considerable portion of variations in the dependent variable is explained by the independent variables. The F-statistics of 0.0057% is statistically significant, showing a considerable harmony between returns on assets of manufacturing companies and all the explanatory variables. This confirms that all the independent variables jointly have significant influence on the dependent variable. The D.W. statistic of 1.86 indicates no serial correlation associated with the regression result. The cross-section random rho was 0.8035 showing that the cross-section random effect is significant and present in the model since the value is less than 5%.

The result shows that reduction in cash conversion cycle, account receivable days, debt repayment period and liquidity ratio increase the firm performance. This is evident as their probabilities are statistically significant and the coefficients are negative. It is expected that the shorter the cash conversion cycle, the higher the firm's profitability. The result aligns with this expectation and agrees with the findings of Usama (2012), Mawutor (2014), Hassan, Mberia & Bellouma (2014), Akinyomi (2014) and Muturi (2017). An extended debt repayment period gives the business access to a longer repayment period, higher loan amounts and lower interest. The result from the study revealed that as the number of debt repayment period increases, firms' profitability reduces. The implication of this result is that longer repayment periods of firms have negatively affected profitability of the firms. This is in agreement with finance theory and the findings of Lazaridis & Tryfonidis (2006), Padachi (2006), Raheema and Nasr (2007) who found the existence of a significant negative relationship between debt repayment period and firm's profitability.

It is expected that companies' profitability should increase when current assets increase. An increase in the current ratio will make a firm more capable of meeting its obligations because its short-term assets' value is greater than its short-term obligations' value. The result from the study showed that current ratio failed to agree with the theoretical prediction and also failed to agree with the findings of Le, Vu., Du, Le & Tran (2018) who found that current ratio has a significant negative effect on firm's profitability. Thus, the current ratio has failed to improve the profitability of listed firms in Nigeria. Also, more extended account receivable days will reduce profitability. The longer the days it takes to receive debts, the lower the firm's performance. Therefore, if it takes a firm longer to have its debts paid by creditors, the financial performance of listed manufacturing firms is hampered. The result from the study aligns with theoretical predictions and the findings from the studies carried out by Madugba and Ogbonnaya (2016).

CONCLUSION AND RECOMMENDATIONS

Thus, the study concludes that all the explanatory variables (cash conversion cycle, account receivable days, debt repayment period and current ratio) have significant and negative effect on the financial performance of manufacturing firms listed on the Nigerian Stock Exchange. Thus, the components of working capital management determine the financial performance of firms since these variables can either improve or decrease the profitability of any business.

Based on the study's findings, it is recommended that working capital components be properly assessed by finance managers, and that any subsequent policies should ensure that the cash conversion cycle is drastically decreased to increase profitability. Additionally, listed manufacturing companies should make an effort to consistently keep their liquidity ratio high in order to pay their short-term financial obligations. Also, accounts receivable days should not be excessively long to prevent the time it takes a customer to pay a business for the goods or services they purchased from being unnecessarily extended, the debt repayment period should be extended to allow for a longer period of repayment, higher amount of loans, and low interest.

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