

IMPACT OF WORKING CAPITAL MANAGEMENT ON THE PROFITABILITY OF FIRMS IN NIGERIA

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Abstract

This study assessed the impact of working capital management on profitability of firms in Nigeria. Secondary data from the annual reports of five Nigerian companies were used in the study. Static panel analysis of random effect regression was used in the study. Receivable days were found to be a significant determinant of firms' profitability. Additionally, the study found that a key factor influencing the profitability of Nigerian businesses is the inventory turnover ratio. The study concluded that working capital management significantly affects profitability of Nigerian firms. In order to produce sufficient profitability for owners and shareholders, it was advised that listed companies should focus more on bringing inventories and accounts receivable down to a manageable level.

1. Introduction

A key component of financial management, working capital management (WCM) has the capacity in creating wealth for a firm (Kalu, 2023). It encompasses any administrative decision or activity that typically affects the quantity and efficiency of working capital (Karl, 2020). As an accounting strategy, WCM concentrates on maintaining optimal levels of current assets and current liabilities to guarantee that there is sufficient cash flow to meet short-term obligations (Horne et al., 2019).

WCM's primary objective is to maintain liquidity in day-to-day operations to prevent excessive pressure from creditors and suppliers and to facilitate smooth business operations (Horne et al., 2019). It is crucial to keep in mind that inefficient WCM not only reduces profitability but also exposes companies to financial crises and their aftermath (Krueger,

2021). Working capital management assists in maintaining an optimal level of working capital to avoid both excess and insufficient capital. Azam (2020) suggested that manufacturing companies' ability to maintain daily liquidity to pay their debts is crucial, but managers may find it challenging to strike this balance. This is in light of the significance of WCM to an organization's financial health and how it impacts both liquidity and profitability. According to Bello (2023), the recent global economic crisis has significantly hurt the profitability of listed companies on the Nigerian Stock Exchange, particularly in the food and beverage production sector. Additionally, there is evidence that some managers do not follow recognised financial concepts when making working capital decisions; instead, they rely on flawed models or inaccurate manuals (Gilbert et al., 2022). This reliance on inaccurate methodologies hinders the effective management

of the available working capital mix and can result in overcapitalization, undercapitalisation, or even the danger of liquidation.

Little is known about how working capital management impacts the profitability of Nigerian manufacturing enterprises, despite the fact that it is crucial for optimising financial performance and operational efficiency. The challenge is made worse by the dearth of empirical studies, particularly those that concentrate on the Nigerian manufacturing sector (Yahaya and Bala, 2022; Ukaegbu, 2024; Ganesan, 2021; Khan, et al., 2022). The relationship between working capital management methods and the profitability of Nigerian manufacturing firms must be thoroughly examined in order to make informed financial decisions and guarantee long-term business success (Smith, 2019).

Only the receivables turnover ratio, payables turnover ratio, and inventory turnover ratio have been combined in a small number of earlier studies on the working capital and profitability of Nigerian manufacturing firms (Uko et al., 2023; Adeniran & Adeyemi, 2022; Owolabi & Adeniyi, 2021; Okoye et al., 2020; Adeyemi & Adegbite, 2019; and Akintoye & Ogundeji, 2020). The majority of earlier research on the effect of working capital management on the profitability of Nigerian listed manufacturing companies used variables like cash and quick ratios, but failed to account for the potential for multicollinearity. The literature review and methodology are covered in the next section. The presentation and analysis of the data are covered in the fourth portion, and the conclusion and suggestions are covered in the last section.

2. Literature review

2.2.1 Trade-Off Theory

There is an ideal cash balance that balances the benefits and drawbacks of holding cash, according to Miller and Orr's (1966) trade-off hypothesis. Deloof (2023) claims that, this strategy has been extended to working capital management where companies must properly balance liquidity and profitability. Effective working capital management in the context of Nigerian manufacturing companies requires striking the right balance between the costs of holding too little working capital, such as the risk of financial distress or the inability to meet short-term obligations, and the costs of holding too

much working capital, such as opportunity costs (Oke et al., 2018).

According to the trade-off theory, an excess of working capital lowers profitability by squandering funds that could be utilised to purchase more productive assets (Nguyen et al., 2019). Conversely, a lack of working capital may result in liquidity problems, which may generate financial challenges or missed business opportunities (Deloof, 2023).

Empirical studies have examined the relationship between working capital management and corporate profitability using the trade-off theory as a framework. For instance, Oke et al. (2019) found that an excessively long cash conversion cycle, a symptom of poor working capital management, has a negative impact on the profitability of Nigerian manufacturing firms. This suggests that a working capital level that maximises profitability can be found by balancing the benefits and drawbacks of liquidity management.

Furthermore, Uzoechi and Emenike (2019) investigated the relationship between working capital management and profitability from the perspective of pecking order theory, which is closely related to the trade-off theory. They found that Nigerian manufacturing firms generally prioritise internal finance, including retained earnings, above external funding to meet their working capital needs. This illustrates the trade-off between the benefits of maintaining financial flexibility and the expenses associated with obtaining outside funding.

Empirical Review

Khan et al. (2022) used annual cross-sectional data for the textile, chemical, engineering, and sugar and related industries to examine the impact of working capital management on the profitability of businesses in Pakistan from 2014 to 2019. The results of the investigations in the textile industry indicated that, while APP, CR, and LOS have a positive significant link with NOP, ITID has a significant negative relationship with NOP. The results are the same for the chemical and engineering sectors, with the exception that DR has a significant negative relationship with NOP in the engineering sector. ACP and DR have an inverse relationship with NOP that is not even significant, so they were removed from the model. The findings are comparable in the sugar and associated industries

as well, with the exception that APP has a negligible and negative effect on NOP, but ACP has a substantially significant positive relationship with NOP. Because working capital variables responded differently to profitability in each sector, they argue that each sector has its own dynamics. They therefore proposed that a proper amount of working capital has a crucial effect on a company's liquidity and net operating profitability. However, the sectors' profitability would increase if they managed their working capital more effectively. As a result, working capital and business profitability have a strong, positive correlation.

Ganesan (2021) examined the working capital management effectiveness, profitability, and liquidity of enterprises in the US telecom equipment market using a sample of 443 financial statements from 349 randomly chosen telecom equipment companies between 2015 and 2021. According to the results, there is very little evidence of a negative relationship between IA and DWC. Furthermore, there is a negative correlation between IS and DWC, DSO, DIO, and DPO. However, the link between DSO and IS and IA is not significant enough to be utilised as a predictor of IS or IA. Consequently, there is a negative correlation between working capital management performance and profitability and liquidity. Thus, he concluded that the sector might improve DPO by gaining more credit from suppliers and reduce inventory to raise the efficacy of working capital management.

Magpayo (2019) used 110 Philippine companies that were chosen at random from the 2019 list of the top 1000 Philippine enterprises to try and ascertain the impact of financial leverage and working capital management policies on financial performance. Multiple regression analysis, the ANOVA test, and Pearson rank correlations were conducted. The study's findings indicate that a company's working capital management strategy, financial leverage, and size all significantly affect net income, ROE, and ROA. Financial leverage has a negative impact on net income and a weakly positive influence on ROE, but working capital management policy and firm size have a favourable impact on net income. Although, working capital management may have an impact on the profit of an organization, it can be depicted from the foregoing that the findings of these studies are not that consistent as some found a negative impact, others found a positive impact.

Also, the authors are more of foreign (international authors) than local (Nigerian). Hence, this study explored the extent of the effect which effective working capital management has on the profitability of manufacturing enterprises in Nigeria.

Using 20 businesses in the automotive and oil and gas industries, Qazi et al. (2021) also investigated the effect of working capital on businesses' profitability in Pakistan between 2014 and 2019. Time series data and panel data regression analysis were used in the study. Net working capital (NWC), inventory turnover in days (ITID), days of accounts receivable (NDAR), financial assets to total assets (FATA), profitability (PRT) (profit after taxes), and control variables (current ratio (CR), debt to equity ratio (DER), and natural logarithm of sales (LOS)) were all used to measure the study. NWC has a significant and positive link with PRT, whereas NDAR and ITID have a weak positive relationship with PRT, according to the results of the regression and correlation model used to evaluate the pooled data with the help of E-views software. Conversely, there is a modest negative connection between PRT and FATA, DER, and CR. As a result, only NWC is significant and positive; all other variables are negative and negligible, whereas NDAR and ITID are both positive but not significant. Thus, these findings demonstrate that working capital has a favourable impact on businesses' profitability.

Altaf and Shah (2017) investigated financial limitations, corporate performance, and working capital management. Using the two-step generalised method of moments (GMM), the authors examined 437 companies and found a favourable relationship between cash management, business performance, and financial limitations. Other elements that could impact business performance and financial restraints, such as contingency, cash conversion circle, and account receivables, were not taken into account in this study.

The importance of working capital management in influencing business profitability in Africa's developing nations was investigated by Ukaegbu (2024). The study used balanced data from 2015 to 2019 and a quantitative methodology to examine four African nations. Across several industrialisation typologies, the results showed a significant inverse link between profitability and cash conversion cycle. Based on

the aforementioned, research is still being done to determine how working capital management affects profitability over the long term, particularly in developing nations. Given this, we examine the effect of working capital on profitability in a few African nations using the fully modified least squares (FMOLS) technique. Given the region's low output rate and steadily rising unemployment rate, this is required.

The impact of working capital management on the financial performance of Nigerian deposit money banks was examined by Yahaya and Bala (2022). OLS regression was used in the study to examine six deposit money banks. The performance of deposit money banks and cash receivables were found to be positively correlated. The study found that the account payment period and firm performance were positively correlated, while the cash conversion cycle and firm profitability were negatively correlated. Other working capital management factors, such inventory management and inventory holding period, which have a big impact on business profitability, were not taken into account in this study.

Summary of Research Gap

Only cash operating cycle, payables days, and receivables days have been combined in a small number of earlier studies on working capital and profitability of Nigerian manufacturing firms (Uko et al., 2023; Adeniran & Adeyemi, 2022; Owolabi & Adeniyi, 2021; Okoye et al., 2020; Adeyemi & Adegbite, 2019; and Akintoye & Ogundeji, 2020). The majority of earlier research on the effect of working capital management on the profitability of Nigerian listed manufacturing companies used variables like cash and quick ratios, but failed to account for the potential for multicollinearity. In order to fill the gap in the literature, this study will concentrate on three key variables: the payables, receivables, and inventory turnover ratios. This will allow for a more thorough examination of the topic.

3. Methodology

The analysis made use of secondary data from the 2019–2023 annual reports of a few chosen companies. The businesses include Nestle Nigeria (food and drink industry), Unilever Nigeria PLC (consumer goods industry), Dangote Group (cement industry), BUA Group (sugar & flour industry), and Cadbury Nigeria (confectionery industry). These companies are regarded as top achievers in their respective industries in terms of capitalisation, and as such, they should be able to represent Nigeria's manufacturing sector, according to Nairametrics (2023). Three models of estimation were used: Random Effect, Fixed Effect, and Pooled OLS. The Breusch Pagan (BP) Lagrangian multiple test aids in choosing the best model from both fixed effect and pooling OLS. A Hausman test aids in choosing the best model among both fixed effect and random effect models.

Model specification

The functional specification of the model is presented as:

$$ROA = f(CR, QR, COC, RD, PTR, ID, RTR, ITR) \dots \dots \dots Eq (1)$$

The model is expressed econometrically as:

$$ROA = \beta_0 + \beta_1 CR + \beta_2 QR + \beta_3 COC + \beta_4 RD + \beta_5 PTR + \beta_6 ID + \beta_7 RTR + \beta_8 ITR + \mu_t \dots Eq(2)$$

Where:

ROA= Return on Asset

CR=Current ratio,

QR=Quick ratio,

COC=Cash operating cycle,

RD=Receivables days,

PTR=Payable turnover ratio,

ID=Inventory days,

RTR=Receivables turnover ratio, and

ITR=Inventory turnover ratio

β_0 =Regression Constant

$\beta_1, \beta_2, \beta_3$ and β_4 = Regression coefficient.

μ_t =Stochastic Error Term

4. Data Analysis and Discussions

Table 1: Descriptive Statistics

Variables	Mean	Maximum	Minimum	Std. Dev.	Obs.
ROA	0.0157	0.060	-0.0368	.0160905	25
CR	13.57	20	6	2.530434	25
QR	0.1485	0.3333	0	.0641327	25
COC	0.3766	0.6923	.1	.1110111	25
RD	0.0023	0.0135	0	.0032718	25
PTR	4.2564	12	1	2.821236	25
ID	0.4487	1	0	.5005824	25
RTR	14.340	597.50	2.5555	66.9877	25
ITR	20.934	22.4403	19.141	.7167359	25

Source: Authors' Computation (2024)

The descriptive statistics for the variables used in the study are shown in Table 1. The results show that the average values of the cash operating cycle, payable turnover ratio, inventory days, receivables turnover ratio, quick ratio, current ratio, and quick ratio are 0.0157, 13.57, 0.1485, 0.3766, 0.0023, 4.2564, 0.4487, 14.340, and 20.934. .0160905, 2.530434, .0641327, .1110111, .0032718, 2.821236, .5005824, 66.9877, and .7167359 are the standard deviations of the variables, respectively. The minimum and maximum values for QR and ID are 0 and 1, respectively. Similarly, the lowest values of ROA and RTR are -.0368 and 2.5555, respectively, while the highest values are 0.060 and 597.50.

Similarly, CR has a minimum of 6 and a maximum of 20 numbers. Over the period under consideration, the companies' COC ranges from .1 to 0.6923, while the inventory turnover ratio ranges from 19.141 to 22.4403. This indicates that all of the variables have changed significantly over time. It is worthwhile to look at this huge variation. Thus, from 2019 to 2023, the present study assesses how working capital management affects the financial performance of businesses listed on the Nigeria Stock Exchange.

Table 2: Correlation Matrix

Correlation	CR	QR	COC	RD	PTR	ID	RTR	ITR	VIF
1. CR	1.0000								1.10
2. QR	-0.1841	1.0000							1.12
3. COC	0.1919	-0.2559	1.0000						1.23
4.RD	0.3731	-0.2030	0.0430	1.0000					1.30
5. PTR	0.4465	-0.1401	0.1219	0.2887	1.0000				1.35
6. ID	0.3774	-0.1631	0.2689	0.0855	0.1842	1.0000			1.07
7. RTR	-0.1314	0.0722	0.1066	0.0936	0.1003	-0.1199	1.0000		1.03
8. ITR	-0.1232	0.0945	0.2662	0.0249	0.1291	0.4287	-0.0819	1.0000	1.15

Source: Authors' Computation (2024)

The presence of multicollinearity is one issue that compromises the evaluations of regression assessors. To evaluate this, a pairwise correlation was conducted. This demonstrates the type of relationship that exists between each set of variables. According to the review's aftereffect, the correlation coefficient for each element is less than 0.5. Multicollinearity is considered an issue by the rule if a coefficient value of more than 0.8 is obtained; otherwise, it is not. Additionally, the Variance Inflation Factor (VIF) test was used to determine whether multicollinearity was present.

The VIF results show that the current ratio, quick ratio, cash operating cycle, receivables days, inventory days, receivables turnover ratio, payables turnover ratio, and inventory turnover ratio all have coefficients 1.10, 1.12, 1.23, 1.30, 1.35, 1.07, 1.03, and 1.15 below 0.5. Consequently, everything seems to be in order, and multicollinearity is absent from the model. Since there is no multicollinearity, the fixed effect and random effect are applied without deleting any of the variables.

Table 3: Test results

Model	Breusch-Pagan Multiplier (LM) Test		Lagrange		Hausman test	
	chi-Statistics	P-value	chi-Statistics	P-value	chi-Statistics	P-value
ROA	463.37	0.0000	5.03	0.6558		

Source: Author's Computation (2024)

Interpretation of Result of Breusch-Pagan Lagrange Multiplier (BP) Test

The BP test has a flaw in that it makes the assumption that heteroskedasticity will be a linear function of the independent variables. Table 3 shows the results of the BP tests, which consistently reject the homoskedasticity null hypothesis. Consequently, the quantitative proof shows that panel data regression with fixed and random effects is the method that best fits the models.

Interpretation of Hausman test

The Hausman test is used to compare the fixed and random effect models. The null hypothesis of the Hausman test asserts that the

random (or fixed) random is uncorrelated with other regressors (independent variables) and that a random effect performs better than a fixed model. A fixed effect model, on the other hand, stays neutral and stable, whereas a random model will break the Gauss-Markov hypothesis and yield biased and inconsistent results if the null hypothesis is rejected. If the null hypothesis is rejected, use the fixed effect model to make things easy; if not, use the random effect model. According to the Hausman test results displayed in table 2 above, the model's p-values are higher than 5%. This means that the results of the random effect model outweigh those of the fixed effect models, the chi-statistics are significant, and the null hypothesis is rejected.

Table 4: Result of Fixed Effect and Random Effect Models for Return on Assets

Dependent Variable: Return on Assets			
Independent variables	Fixed Effects Coefficients (standard errors)	Random Effects Coefficients (standard errors)	Coefficients
Current ratio	.1711575** (.0352969)	.1032272** (.0345307)	
Quick ratio	-.0143325 (.2990797)	.1161166** (.0385017)	
Cash operating cycle	-.1746602 (.3091421)	-.0587739 (.1190258)	
Receivables days	.4250837*** (.2750272)	.3648939*** (.0850721)	
Payable turnover ratio	-.0047849 (.0055558)	-.003361 (.0030174)	
Inventory days	.0095032** (.0047301)	.0128024*** (.0034748)	
Receivables turnover ratio	.0427951 (.0973532)	.005465 (.0278458)	
Inventory turnover ratio	.5048133*** (.1280318)	.641382*** (.0812088)	
Const	-4.989962*** (.605511)	-6.428318*** (1.175609)	
Observations	25		
Number of CID	5		

Source: Author's computations using STATA 14, 2024.

Standard errors in parentheses***, ** and * denotes 1%, 5% and 10% level of significance respectively

Interpretation of Random Effect Models for Internal Environment on Cash Flow

The regression results of the random effect model employed in this study show a variety of statistics. Nonetheless, the sign, size, and significance of the coefficient (3S) are the most important statistics. While the sign of the coefficient indicates whether the relationship between the independent and dependent variables is positive or negative, the size of the coefficient reveals the degree to which the independent variable influences the dependent variable. In a similar vein, the significance shows the degree to which the independent factors impact the dependent variable.

The results of the regressions looking at the relationship between working capital and the profitability of industrial companies listed in Nigeria are shown in Table 4.4. The random effect model shown in column 2 indicates that cash flow is the dependent variable. The independent variables are the cash operating cycle, quick ratio, current ratio, days of receivables, payable turnover ratio, inventory days, receivables turnover ratio, and inventory turnover ratio. The results of the random effect model show a negative correlation between the cash operating cycle and payable turnover ratio (column 2). As an alternative, consider the turnover ratios for inventory and receivables, the quick ratio, the current ratio, receivables days, and inventory days. This implies that the return on assets of Nigerian listed companies increases with the amount of working capital available.

However, the results of the random effect model show that the current ratio, quick ratio, receivables days, inventory days, and inventory turnover ratio are the main determinants affecting the return on assets of Nigerian listed companies. The random effect models' coefficients, which are .1032272, .1161166, .3648939, .0128024, and .641382 with the matching standard errors of .0345307, .0385017, .0850721, .0034748, and .0812088, serve as evidence for this. Given that half of its coefficients are greater than standard errors, the variable is statistically significant. Therefore, the current ratio, quick ratio, receivables days, inventory days, and inventory turnover ratio all have a major impact on return on assets for Nigerian businesses.

The coefficient estimates show that for every unit increase in the current ratio, quick ratio, and receivables days, the return on assets of

Nigerian listed companies will rise by .10, .11, and .36 units. The coefficient also indicates that the return on assets of Nigerian listed companies will increase by .01 and .64 units for every unit increase in inventory days and inventory turnover ratio, respectively.

Discussion of Findings

A static panel of random effect was used to examine how working capital management affected Nigerian companies' profitability. In line with the findings of Oluoch (2016), Kinyanjui et al. (2017), and Maria et al. (2015), the study revealed a significant correlation between the ratio of payable turnover and the profitability of Nigerian businesses. These results support the rejection of the null hypothesis, which states that the ratio of receivable turnover has no discernible impact on Nigerian companies' profitability. Thus, it is appropriate to reject the null hypothesis, which claims that the payable turnover ratio has no discernible impact on the profitability of Nigerian businesses.

The study also looked at how the inventory turnover ratio affected Nigerian businesses' profitability. According to this study, the inventory turnover ratio significantly influences Nigerian profitability. These indicate that the null hypothesis, according to which the inventory turnover ratio has no discernible impact on return on assets in Nigeria, ought to be disproved. The findings of Oroka (2017), Mshelia (2017), and Abimbola and Kolawole (2017) are all in agreement with this outcome.

5. Conclusion and Recommendations

According to the study's findings, working capital significantly affects the profitability of Nigerian listed companies, receivable days are a significant determinant of Nigerian firms' profitability, and the inventory turnover ratio is a significant determinant of Nigerian firms' profitability. Accordingly, in order to produce enough profit for owners and shareholders, the study advises listed companies to concentrate more on cutting down on the number of days that inventories and accounts receivable are kept to a reasonable minimum. In order to develop and execute advantageous policies that would enhance working capital management practices, businesses should be aware of the various working capital management practices (i.e., cash management practices,

accounts receivable management practices, inventory management practices, accounts payable management practices, and investment management practices). The ratio of profitability to liquidity should be balanced. The managers of these companies should make sure that they place a higher value on cash so that they always have enough cash to pay their debts; they should handle stocks and inventories more carefully; and they should try to keep enough inventory so that they don't experience stock-outs because almost all of the companies that were the subject of the study had low rates of liquidity. While it's good to make sales, it's not a good idea to sell everything to prevent stockouts, which can occur if there are frequent, large sales, as is the case in all of the companies evaluated.

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