

Moderating Effect of Finance Cost on Working Capital-Firm Value Nexus in Manufacturing Companies

Fatai Abiodun Atanda (University of Ibadan),

Olubunmi Osemene (University of Ilorin),

Oluwaseun Ogunleye (University of Ibadan)

Abstract

Building an enduring business model requires efficient management of working capital, which is often difficult to consistently manage, especially in a manufacturing setting. This study investigated the effect of working capital on firm value, given the changing cost of financing manufacturing activities in Nigeria from 2011 to 2022. Using resource-based view as a theoretical bedrock and correlational research design, the study collected data from annual reports of the selected manufacturing firms, which was analyzed by employing descriptive and inferential tools, static panel data technique, and econometrics tests. Results revealed that cash conversion cycle and inventory conversion period demonstrated significant effects on firm value. With low cost of financing, the negative impact of long cash conversion cycle on firm value was reduced. Hence, a faster cash conversion cycle with lower finance cost was a responsible business practice for enhancing firm value and that finance cost was a good moderator of the relationship between working capital and firm value.

Keywords: firm value, finance cost, cash conversion cycle, working capital turnover

JEL classification: M41, M40, G40, G32

Introduction

Building an enduring business model for improved performance and long-time survival requires efficient management of resources. However, manufacturing firms are bedeviled with many constraints, among which is inefficient working capital management (Lawal and Aduku, 2020). According to the global survey by PWC (2015), only 9% of companies managed working capital efficiently and consistently over multiple years. In another global study, PWC (2022) found that net working capital increased by 25 percent while working capital days increased from 40.7 days to 44.9 days, from 2016 to 2020. The general business problem is that many manufacturing companies did not still understand that working capital is a fundamental resource that they must not lose sight of, especially in a rapidly

changing, turbulent and uncertain business environment and period (Bakare, et al., 2023; Aldubhani, et al., 2022).

Empirical studies on the link between working capital and firm performance have produced inconclusive results. On the one hand are studies, which established that efficient working capital considerably enhanced operational performance and business profitability (Olaoye *et al.*, 2019; Alvarez *et al.*, 2020; Baos-Caballero *et al.*, 2020). On the other are other studies, which averred that working capital investment reduced firm value (Raji *et al.*, 2017; Dhole *et al.*, 2019; Olivia *et al.*, 2021). These discrepancies in results pointed to the need for more research that looked at the cost implications of the different sources of capital.

In addition, previous studies have established a significant relationship between finance cost and firm value, in line with the capital structure theory (Sumardani and Handayani, 2019; Ibrahim and Badara, 2020). There is even a trade-off between cost of funds and the benefits of having adequate funds to run a business without excessive liquidity risk (Eljelly, 2004). Prasad *et al.* (2019) found that finance cost is a determinant of working capital and demonstrated that increased cost of financing tends to erode the benefits (e.g. increased firm value) of efficient working capital. Investigating working capital and firm performance relationship is therefore not complete without considering the influence of finance cost in the relationship. The specific research problem is that managers and policy maker do not have ample empirical information on the moderating role of finance cost in working capital-firm value relationship, especially in developing economies like Nigeria where manufacturing firms struggle for funds at high cost, to meet their working capital requirements. So, as a contribution to the working capital and firm value literature, this study examines the efficacy of working capital and finance cost in predicting the value of listed manufacturing firms in Nigeria. The study hypothesizes that

Finance cost does not have a significant moderating effect on the relationship between working capital and firm value.

The motivation for this study lies in the fact that inadequate or excessive working capital has severe consequences for manufacturing firms (Olaoye *et al.*, 2019). Inadequate working capital affects cash flows and operations, leads to poor raw materials scheduling, production

interruptions, loss of trade and cash discounts, and reduction in return on investment (Pandey, 2016). Similarly, excessive working capital results in decreased efficiency; unnecessary purchases and inventory accumulation; defective credit policy; higher incidence of bad debts; loss of profits; low return on investment and decrease in value of shares (PWC, 2019). There is therefore the need to empirically determine the working capital turnover rate and cash conversion cycle (and its components) of the Nigerian manufacturing firms to ascertain their overall or average level of efficiency in managing working capital.

In addition, previous studies showed discrepancies in scope, methodology, and operational definitions as well as units of analysis selected from developed and emerging markets. Their findings are therefore not easily applicable to firms in developing economies like Nigeria where manufacturing firms often rely on internal sources and underdeveloped financial markets for financing. Many studies focused on aggregate measure of working capital, and assumed that non-current assets should be financed by long-term funds and working capital by short-term funds, ignoring the costs of frequent financing and exposure to shocks from financial markets. Empirical information is therefore needed on the efficacy of working capital and finance cost in predicting firm value.

Moreover, managers are desirous of the information on the factors that enhance firm value and increase shareholders' wealth. They do not know the potency of working capital and the moderating role of cost of financing on the negative impact of inefficient working capital on the value of

their businesses. So, identifying the factors that enhance firm value is of interest to them, to aid in formulating policies and strategies needed to optimally monitor and control working capital components. This study therefore provides valuable insights into the efficacy of low cost of financing in ameliorating any negative impact of longterm cash conversion cycle and low working capital turnover on firm value since finance cost employed by a firm has consequences on its value.

This study added to the body of knowledge in the following ways. First, we examined the average working capital, in terms of working capital turnover and working capital days (and its components). These results revealed the level of efficiency of the selected listed manufacturing firms in managing their working capital. Secondly, the findings of the study suggested that for managers to generate favourable high returns to investors, low cost of financing, low cash conversion cycle and low inventory conversion cycle are essential ingredients. This is because the variables exhibited a very strong and significant influence on firm value.

Finally, this study provided insights into the moderating role of finance cost on working capital - firm value nexus, on which ample empirical information is lacking in the extant literature. The study established empirically that with low cost of financing, the negative impact of a long cash conversion cycle on firm value tends to reduce. Apart from this introductory section, the remaining part of this paper is divided into four sections. Section 2 covers literature review, section 3 deals with methodology and section 4 presents and discusses results and section 5 concludes the paper.

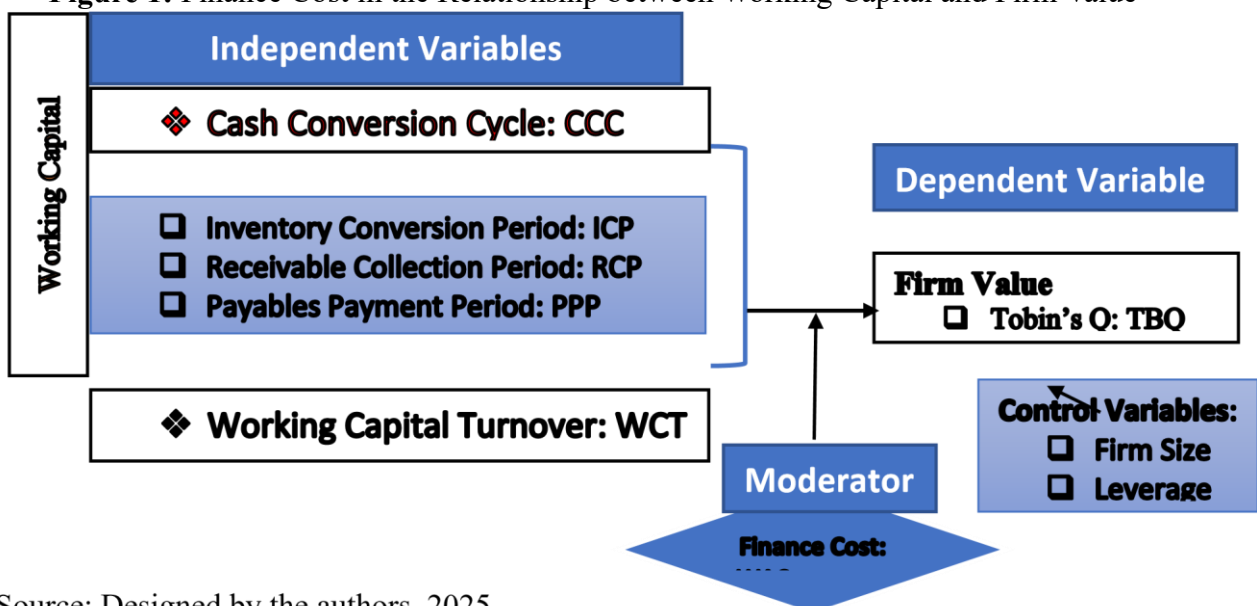
Literature Review The theory of resources-based view is the theoretical bedrock of this study. The theory posits that the resources possessed by a firm will assist it in achieving a higher level of performance (Penrose, 1959). The theory gave an insight into the process of resource acquisition, utilization, and expansion to gain competitive advantage and increase performance (Rugman & Verbeke, 2002). The fundamental idea of the theory is that competitive advantage and better performance will be achieved primarily in the acquisition and application of a bundle of valuable resources at a firm disposal. The theory applies to this study because working capital is part of the resources needed to be acquired and utilized efficiently, especially in manufacturing firms where working capital components frequently change in form and amount, from time to time. They therefore need to be managed efficiently throughout a period.

Conceptually, working capital efficiency is the management of different working capital components such that an adequate amount of working capital is in place for a firm's smooth operations and the attainment of dual objectives of liquidity and profitability (Omolehinwa, 2019). If working capital is managed optimally, firms will invest in it, finance it, and monitor factors that influence it (McInnes, 2000). Working capital has been posited to impact the effectiveness of long-term investments and the ability of a firm to cover short-term liabilities. The purpose of analyzing its impact is to ensure that assets are used effectively for overall efficiency and shareholders' wealth maximization (Diallo and Obotto, 2003).

Finance cost is the interest rate or the expected rate of return on capital in a riskequivalent alternative investment. Extant literature reported that finance cost affected directly firm value. Notable among the studies was Fizza & Mirza (2021), which examined the influence of finance cost and firm value on investment decisions of the firms listed on the Pakistan Stock Exchange from 2008 to 2014. Using Variance inflation factor (VIF) and In Aktas *et al.* (2015), it was discovered that effective working capital management enhanced firm value. Using panel data obtained from 75 non-financial enterprises listed on the Johannesburg Stock Exchange, Oseifuah & Gyekye (2017) found that working capital management, inventory conversion period and receivables period had negative connections with corporate profitability but payables deferral period had a significant

Generalized least square (GLS) methods to analyze data, results revealed that the weighted average finance cost had a negative association with investment decisions. This implied that a high finance cost led to low investment and vice versa but a positive relationship between investment decisions and firm value was found. Figure 1 shows the relationship between working capital and firm value and the moderating role of finance cost. In addition, Olaoye *et al.* (2019) used data collected from 10 listed firms from 2008 to 2019 and established that cash collection period and cash payment period negatively impacted return on assets whereas, current ratio and inventory period had a positive impact on return on assets. In another study, Dhole *et al.* (2019) discovered negative correlations between financial constraints and future share price, which were significantly weaker for firms with

Figure 1: Finance Cost in the Relationship between Working Capital and Firm Value



Source: Designed by the authors, 2025.
positive relationship with profitability. Their findings revealed that managers increased shareholders' value by decreasing cash conversion period to the extent of boasting firm profitability.

excellent working capital management, using a sample of 8,010 firms listed on the Australian Stock Exchange. This means that the companies had better market valuations even when financially constrained.

However, Baos-Caballero *et al.* (2020) used data on firm-specific variables, collected from the COMPUSTAT database of 30 countries between 1995 and 2013 with 129,116 observations, representing 18,753 firms around the world. According to findings, the value of net operating working capital differed among nations that depend on investors' protection and financial and economic development. They concluded that net operating working capital was more valuable to shareholders in countries with stronger investor rights enforcement and greater financial and economic development. By combining data envelopment analysis (DEA) with structural equation modeling, Seth *et al.* (2020) created an integrated strategy for working capital and company performance. DEA was used to calculate working capital management efficiency for 212 Indian manufacturing companies from 2008 to 2019. The average mean efficiency ratings for Indian manufacturing firms ranged from 0.623 to 0.654, showing that they only function at roughly 60% of working capital management efficiency.

Again, Sari, *et al.* (2020) used capital structure as a moderating variable in the relationship between profitability, liquidity, and firm value using path analysis. Their results showed that liquidity had a significant negative impact on capital structure and that capital structure mediated the relationship of profitability and liquidity with firm value. Ibrahim & Badara (2020) used micro panel analysis and hierarchical moderated multiple regression to analyze data obtained from 12 listed industrial goods firms on the NGX covering 2006-2016 to investigate the moderating effects of finance cost on equity financing and firm value

relationship. The study established a positive connection between equity and firm value, with the finance cost acting as a good moderator. The study concluded that equity financing and finance cost were important factors in increasing firm value.

From the literature review, we deduced that the relationship between working capital and firm value was inconclusive, due to the lack of agreement in findings. In some studies, efficient working capital significantly improved firm performance (Ibrahim *et al.*, 2021; Baños-Caballero *et al.*, 2020). For some others, it was value-reducing (Olivia *et al.*, 2021; Dhole *et al.*, 2019; Raji, *et al.*, 2017). The discrepancies in findings can be attributed to differences in scope, business environment, types of firms, conceptual, methodological, and contextual setups, as well as unequal operational definitions of variables. Besides, many studies focused on large corporations in developed and emerging markets. This made it difficult to generalize their findings to firms in developing economies like Nigeria where firms operate in rather underdeveloped financial markets and rely heavily on internally generated funds, trade credits, and short-term bank loans for financing.

Another notable gap in the literature was the focus on the absolute measure of working capital. Many studies did not decompose working capital for a more thorough and deeper analysis. In addition, it was widely assumed (Hansen, 2022; Omolehinwa, 2019) that funds for noncurrent assets should be sourced from long-term sources while working capital should be sourced from short-term sources, thinking that implementing this strategy will reduce investments in working capital and lowers the cost of financing. This

position failed to recognize the main disadvantage of necessitating frequent financing and the susceptibility of firms to a high cost of funds. In the light of this, further research into the working capital-firm value relationship is needed, especially in the Nigerian context, like this present study. This is to ascertain the extent to which finance cost contributes towards the reduction of any negative impact of inefficiencies in working capital management in manufacturing firms.

Methodology

This study adopted correlational research design since our interest is to determine the relationships among variables. The target population consists of all manufacturing firms listed on the NGX. The study selected twenty (20), representing 62.5 % of the 32 firms operating in the Consumer Goods and Industrial Goods industrial sectors. These two segments dominated the manufacturing sector of the Nigerian economy in terms of number of listed firms and outputs. The percentage is large enough to allow the generalization of findings and conclusions to the larger population of manufacturing firms in the two sectors. The sampling technique was based on the availability of data while the choice of the sectors was premised on the fact that working capital components such as cash, receivables, and payables form a significant part of the current assets and liabilities of the firms compared to firms in other sectors.

Model Specification and Variables Measurement

The model for this study was designed to demonstrate a link between the independent variables (working capital), moderating variable (finance cost), control variables (firm size and leverage), and

dependent variable (firm value), using multiple linear regression equation. The firm value model is expressed in econometrics form as:

$$TBQ_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 WCT_{it} + \beta_3 FSZ_{it} + \beta_4 LEV_{it} + \xi_{it} \quad (1)$$

The dependent variable was proxied by TobinQ (TBQ) while the explanatory variables are cash conversion cycle (CCC), working capital turnover (WCT), firm size (FSZ), and leverage (LEV). Cash conversion cycle is decomposed into its three components: inventory conversion period, receivables collection period, and payables payment period then, we have equation (2):

$$TBQ_{it} = \beta_0 + \beta_1 ICP_{it} + \beta_2 RCP_{it} + \beta_3 PPP_{it} + \beta_4 FSZ_{it} + \beta_5 LEV_{it} + \xi_{it} \quad (2)$$

where, TBQ is firm value for firm i at time t ; ICP is inventory conversion period of firm i at time t ; RCP is receivables collection period of firm i at time t ; PPP is payables payment period of firm i at time t ; β_0 = constant; β_{1-5} are coefficients of the independent and control variables; and ξ is stochastic error term.

To establish the moderating role of finance cost on the relationship between working capital and firm value, the following equations are specified:

$$TBQ_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 WCT_{it} + \beta_3 WAC_{it} + \beta_4 (CCC*WAC)_{it} + \beta_5 (WCT*WAC)_{it} + \beta_6 FSZ_{it} + \beta_7 LEV_{it} + \xi_{it} \quad (3)$$

and,

$$TBQ_{it} = \beta_0 + \beta_1 ICP_{it} + \beta_2 RCP_{it} + \beta_3 PPP_{it} + \beta_4 (ICP*WAC)_{it} + \beta_5 (RCP*WAC)_{it} + \beta_6 (PPP*WAC)_{it} + \beta_7 FSZ_{it} + \beta_8 LEV_{it} + \xi_{it} \quad (4)$$

where, $CCC*WAC$, $ICP*WAC$, $RCP*WAC$, $PPP*WAC$, and $WCT*WAC$ are the

moderated independent variables. All the variables were measured as summarized in

Table 1.

Table 1. Measurement of Variables

| Variable | Acronym | Measurement | Explanation | A priori | Empirical References |
|-----------------------------|---------|-----------------------------------------------------------------|------------------------------------------------------------------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Financial Value | TBQ | $\frac{\text{Market Capitalization}}{\text{Total Assets}}$ | Ratio, computed as market capitalization divided by total assets | | Shadab & Sattar, (2015), Arachchi, <i>et al.</i> (2018) |
| Conversion Inventory Period | ICP | $\frac{\text{Average Inventory} * 356}{\text{Cost of Sale}}$ | Times (in days) required to convert inventory into cash | -ve | Oseifuah & Gyekye (2017) Arachchi <i>et al.</i> (2018), Olaoye <i>et al.</i> (2019), Alvarez <i>et al.</i> (2020), www.mahameratios.com site |
| Receivable Period | RCP | $\frac{\text{Average Receivables} * 356}{\text{Sales Revenue}}$ | Times (in days) required to collect cash from debtors | -ve | |
| Payables Payment Period | PPP | $\frac{\text{Average Payables} * 356}{\text{Cost of Sale}}$ | Number of days for which trade payables remain unpaid | +ve | |

Cash Conversion Cycle

CCC = ICP + RCP – PPP

Times (in days) between inventory investing, conversion to finished goods, sales and receipt of cash from debtors

-ve

Working Capital Ratio

Net Annual Sales Ratio of funds used to finance operations +ve and revenues

Current Assets – Current Liabilities generated.

Omolehinwa (2019)

| | | | | |
|--------------------------------|----------|-------------------------------------------------|---------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| C os Fi na nc e | WAC | $MV (Equity * K_e) + BV (Debt * K_d)$ | | |
| | | (MV of Equity + BV of Debt) | | |
| | | Natural logarithm of Total Assets | | |
| Fi r m ze | Si ze | | | & (2020) |
| ag £ ev | LEV | $\frac{\text{Total debt}}{\text{Total Assets}}$ | This measures the extent of firm indebtedness | -ve Alvarez <i>et al.</i> (2020) |
| <hr/> | | | | |
| | FSZ | | This measures the average financing cost of using equity and debt in a company. | -ve Prasad <i>et al.</i> (2019), Ibrahim & Badara (2020); Fizza & Mirza (2021) |
| | | | This is a measure of the size of a firm | +v e Dhole <i>et al.</i> (2019), Anton |

Source: Authors' compilation, 2024.

Data and Analysis Methods

This study employed secondary data, sourced from the audited annual reports of the listed manufacturing firms from 2011-2022. Balanced panel data was employed due its several advantages. According to Olubusoye *et al.* (2016), panel data allows researchers to control for any individual heterogeneity arising in a model due to the different firms'

characteristics and, therefore, removes the risks of obtaining biased results. Additionally, it provides more variability, more degrees of freedom, efficiency and less collinearity between variables.

Descriptive tools such as mean, median, and standard deviation were used to describe the features typical of all the variables. We used econometrics approach of performing a panel regression analysis, which requires that diagnostic tests should

be carried out, to detect any potential problems with data series and/or models. To rely on the estimated coefficients and consider them to be accurate representations of true parameters, we tested the assumptions of linear regressions formulated in the Gauss-Markov theorem by conducting some pre-estimation tests. Most of the assumptions however relate to the characteristics of the regression residuals. Data was analyzed using Stata software package, version 15.

Model estimation was carried out in two ways. First, pool ordinary least square regression (POLS) was used to estimate each model after pre-estimation tests like Jarque Bera's goodness of fit confirmed that data was normally distributed while variance inflation factor (VIF) was used for the presence (or absence) of multicollinearity problem among explanatory variables. POLS method ignores the unobservable cross-sectional and time-specific effects and fails to account for the panel structure of data, with the unrealistic assumption that the intercept and slope coefficient of variables for the twenty firms were the same. To check the reality of these assumptions, Levene's robust test statistic was estimated to get heteroscedasticity robust estimators. Heteroscedasticity is a problem often found in cross-sectional regressions but in panel regressions, both cross-sections and timeseries were used. Similarly, the heteroscedasticity test for serial correlation in panel regression was also tested.

Secondly, random effects (RE) and fixed effects (FE) estimates were obtained and the Hausman specification test was used to select appropriate effects between the two. The null hypothesis of the test is that the

random effect model produces consistent coefficients and therefore should be preferred. The estimated parameters were evaluated to determine the strength and direction of the independent, moderating, and control variables on the dependent variables, using adjusted Rsquare. Statistical significance and testing of hypotheses were evaluated at 99% and 95% confidence levels and 1%, and 5% significance levels, respectively.

Results

Descriptive Statistics

Descriptive statistics explain the characteristics of variables, as presented in Table 2. The result is for the sample of 240 observations. The average firm value (TBQ) was 1.91 with a standard deviation of approximately 2.01, a minimum of 0.02, and a maximum of 13.3 across units. This implies that share prices were more expensive than the replacement cost of assets hence, shares of the firms were overvalued. The average inventory conversion, receivables collection, and payables payment periods, as well as the cash conversion cycle for these firms, were 92 days, 67 days, 125 days, and 132 days, respectively with a standard deviation of 48 days, 62 days 59 days, and 82 days. These showed that the firms, on average, took a longer time to fully convert their inventories to finished products, relying on suppliers to finance their operations before their products were converted to cash through sales.

The working capital turnover ratio of a firm measures the relationship between the funds used to finance operations and the revenues it generates as a result (Omolehinwa, 2019). The average working

capital turnover ratio of -2.52% (with a standard deviation of 54%, minimum of 648%, and maximum of 99%) suggested that the firms had more current liabilities than current assets. These results were a red flag for lenders and creditors because they indicated that most of the firms tend not to have sufficient liquid assets to pay for their short-term obligations.

Meanwhile, the weighted average finance cost of 18% (with a standard deviation of 30%) was a signal of the expected costs for all their financing sources, which will increase when investors require additional return on investment to neutralize business risks.

Table 2. Summary of Descriptive Statistics

| Variables | Obs. | Mean | Std. Dev. | Min | Max |
|------------|------|---------|-----------|----------|---------|
| <i>TBQ</i> | 240 | 1.912 | 2.056 | 0.0224 | 13.289 |
| <i>ICP</i> | 240 | 92.312 | 48.107 | 16.745 | 401.268 |
| <i>RCP</i> | 240 | 66.902 | 61.612 | 3.818 | 427.031 |
| <i>PPP</i> | 240 | 125.360 | 59.123 | 6.915 | 334.204 |
| <i>CCC</i> | 240 | 132.463 | 82.102 | -97.220 | 352.823 |
| <i>WCT</i> | 240 | -2.515 | 54.212 | -647.623 | 99.199 |
| <i>WAC</i> | 240 | 18.196 | 30.341 | 2.02 | 370.689 |
| <i>FSZ</i> | 240 | 7.251 | 0.790 | 5.401 | 9.261 |
| <i>LEV</i> | 240 | 0.537 | 0.283 | 0.0313 | 2.241 |

Source: Authors' Computations using Stata 15.0, 2024.

4.2

Pre- Estimation Tests Results

Performing a panel regression analysis requires diagnostic tests to detect potential problems with data series and/or models specified. These tests include normality test, multicollinearity test, and heteroscedasticity test.

4.2.1 Normality Test Results

The Jarque–Bera test of goodness-of-fit was employed and skewness and kurtosis statistics were used to test the normality of data. The method was used to examine the best statistics for each equation

Table 3. Normality Test

and all equations jointly against the null hypothesis of normality that the data follows a normal distribution while the alternative hypothesis is that the data does not follow a normal distribution. The decision rule was that if the p-value is lower than the Chi (X^2) value then, the null hypothesis cannot be rejected. The results presented in Table 3 showed that the p-values across all variables were less than the Chi (X^2) values hence, the null hypothesis was accepted, meaning that the data was normally distributed.

| Variable | Obs | Pr(Skewness) | Pr(Kurtosis) | Adj Chi ² (X ²) | Prob> Chi ² (X ²) |
|----------|-----|--------------|--------------|----------------------------------------|------------------------------------------|
| TBQ | 240 | 0.0000 | 0.0000 | 7.24 | 0.0000 |
| ICP | 240 | 0.0000 | 0.0000 | 24.13 | 0.0000 |
| RCP | 240 | 0.0000 | 0.0000 | 16.58 | 0.0000 |
| PPP | 240 | 0.0000 | 0.0000 | 48.61 | 0.0000 |
| CCC | 240 | 0.0000 | 0.1015 | 16.79 | 0.0002 |
| WCT | 240 | 0.0000 | 0.0000 | 21.56 | 0.0000 |
| WAC | 240 | 0.0000 | 0.0000 | 10.61 | 0.0000 |
| FSZ | 240 | 0.0417 | 0.0871 | 6.52 | 0.0338 |
| LEV | 240 | 0.0000 | 0.0000 | 67.09 | 0.0000 |

Source: Authors' Computations using Stata 15.0, 2024.

4.2.2

Multicollinearity Test Results

corrected. From the results in Table 4, it was evident that the average VIF for the Variance inflation factor (VIF) was variables included in models 2 and 3, which used to measure the amount of address the first objective that is, the multicollinearity among explanatory relationship between working capital and variables under study. Generally, VIF is firm value were 1.12 and 1.27 respectively. higher than 10, or tolerance is lower than

This suggested no problem of 0.1, or a more conservative threshold of 5 multicollinearity existed in the explanatory or even 2.5 indicates a significant variables included in the specified multicollinearity problem that needs to be regression models.

Table 4. Variance Inflation Factor

| Model 2 | | | Model 3 | | |
|-----------------|-------------|----------|-----------------|-------------|----------|
| Variable | VIF | 1/VIF | Variable | VIF | 1/VIF |
| FSZ | 1.19 | 0.841556 | ICP | 1.49 | 0.673281 |
| CCC | 1.15 | 0.877866 | PPP | 1.37 | 0.734106 |
| LEV | 1.13 | 0.888194 | FSZ | 1.22 | 0.816871 |
| WCT | 1.00 | 0.999756 | LEV | 1.20 | 0.834362 |
| | | | RCP | 1.05 | 0.958454 |
| Mean VIF | 1.12 | | Mean VIF | 1.27 | |

Source: Authors' Computations using Stata 15.0, 2024.

From the results in Table 5, it was clear that the average VIF for the explanatory variables included in models 4 and 5 had estimated coefficients of 1.08 and 1.14, respectively, which are less than 10. The models were specified to address the second objective of this study, aimed at

investigating the moderating effect of finance cost on the relationship between working capital and firm value. The results showed no multicollinearity problem among the explanatory variables of the models.

Table 5. Variance Inflation Factor

| Model 4 | | | Model 5 | | |
|------------|-------------|----------|------------|-------------|----------|
| Variable | VIF | 1/VIF | Variable | VIF | 1/VIF |
| <i>FSZ</i> | 1.15 | 0.866541 | <i>LEV</i> | 1.22 | 0.824246 |
| <i>LEV</i> | 1.14 | 0.874516 | <i>ICP</i> | 1.20 | 0.834524 |
| <i>CCC</i> | 1.12 | 0.895142 | <i>FSZ</i> | 1.18 | 0.847624 |
| <i>WCT</i> | 1.01 | 0.998741 | <i>PPP</i> | 1.12 | 0.893512 |
| <i>WAC</i> | 1.00 | 0.999481 | <i>RCP</i> | 1.08 | 0.938638 |
| | | | <i>WAC</i> | 1.03 | 0.983471 |
| Mean VIF | 1.08 | | Mean VIF | 1.14 | |

Source: Authors' Computation on Stata 15.0, 2024

4.3

Regression Results

To carry out a robust analysis of the across the sectors. It was obvious from the relationship between working capital and

number of days for cash conversion cycle was associated with increased firm value. Heteroscedasticity test (Levene robust test) results in Table 7 that a more robust model POLS was employed to estimate the second that considered the specific nature of the 20 and third models and results are presented selected firms should be considered in Table 6. The results of model (2) because the homogeneity assumption did revealed that firm value increased with a not hold. Hence, a static model with either decreasing number of days for cash fixed (FE) or random effects (RE) should be conversion cycle in absolute measure at a 1 selected. percent level of significance. This meant that when the firms are undifferentiated, a faster cash conversion cycle or lower

Table 6. Regression Results

| Model 2 | Model 3 |
|---------|---------|
|---------|---------|

| Variables | POLS | FE | RE | POLS | FE | RE |
|--------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| <i>ICP</i> | - | - | - | -1.411*** (0.224) | -0.898*** (0.231) | -0.983*** (0.224) |
| <i>RCP</i> | - | - | - | -0.618*** (0.106) | -0.0263 (0.143) | -0.140 (0.124) |
| <i>PPP</i> | - | - | - | 0.752*** (0.182) | 0.201 (0.222) | 0.224 (0.161) |
| <i>CCC</i> | -0.547*** (0.171) | -0.281 (0.145) | -0.286 (0.161) | - | - | - |
| <i>WCT</i> | 0.0341 (0.00216) | -0.0517 (0.00208) | -0.0689 (0.00108) | - | - | - |
| <i>FSZ</i> | -0.181 (0.161) | -1.571** (0.574) | -0.531 (0.312) | -0.287* (0.156) | -1.253** (0.412) | -0.465 (0.215) |
| <i>LEV</i> | 1.580*** (0.501) | 2.0315*** (0.431) | 2.214*** (0.435) | 1.414*** (0.489) | 2.112*** (0.434) | 2.141*** (0.413) |
| <i>Constant</i> | 5.280*** (1.814) | 12.64*** (4.515) | 5.855* (2.871) | 6.914*** (2.250) | 11.06*** (4.414) | 7.411*** (2.820) |
| Observations | 240 | 240 | 240 | 240 | 240 | 240 |
| Adj. R-squared | 0.158 | 0.169 | | 0.218 | 0.213 | |
| Firm effect | No | Yes | Yes | No | Yes | Yes |
| Time effect | No | No | No | No | No | No |
| F-test | 7.8142 | 8.28 | | 10.56 | 8.816 | |
| Prob.>F | 1.46e-06 | 1.61e-06 | 1.12e-06 | 9.66e-08 | 1.14e-05 | 1.32e-08 |
| No. of firms | 20 | 20 | 20 | 20 | 20 | 20 |
| Hausman Test | | | | 6.84 | | 8.58 |
| Prob. > Chi ² | | | | 0.1864 | | 0.1436 |

Source: Authors' Computation on Stata 15.0, 2024. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Hausman test was used to detect the endogenous predictor variables and to choose between the FE and RE models. As the decision rule is to accept null hypothesis if p-value of Hausman test was greater than 5% or accept alternative hypothesis if otherwise. Durbin-Wu-Hausman test results revealed a probability value of 0.1864 and 0.1436, for the two models, respectively and this implies that RE model should be preferred.

In the RE model, neither cash conversion cycle nor working capital

(2019) that investments in working capital reduced firm value. In addition, only leverage, as a control variable, had a significant positive effect on firm value while firm size did not.

However, when cash conversion cycle was decomposed into its three components: inventory conversion period, receivables collection period, and payables payment period, only inventory conversion period consistently had a significant negative effect on firm value across the three models (POLLS, FE, and RE). The results in

Table 7. Levene’s Heteroscedasticity Test Results

| Model 2 | | |
|----------------|--------------|---------------------|
| W0 = 5.536 | df (23, 216) | Pr > F = 0.00000000 |
| W55 = 3.564 | df (23, 216) | Pr > F = 0.00000382 |
| W10 = 4.226 | df (23, 216) | Pr > F = 0.00000014 |
| Model 3 | | |
| W0 = 5.486 | df (23, 216) | Pr > F = 0.00000011 |
| W55 = 3.548 | df (23, 216) | Pr > F = 0.00000512 |
| W10 = 4.491 | df (23, 216) | Pr > F = 0.00000014 |

Source: Authors’ Computations using Stata 15.0, 2024.

turnover ratio had any significant effects on firm value. The results showed that when the selected firms are differentiated, a change in cash conversion cycle and working capital turnover ratio will not bring about any significant change in firm value. These results failed to give support to Aldubhani, et al. (2022), Ibrahim *et al.* (2021) and Baos-Caballero *et al.* (2020) that working capital was a value-enhancing factor but supported the finding of Bakare, et al. (2023) of insignificant negative effect. The findings did not also support Olivia *et al.* (2021); and Dhole *et al.*

model 3 showed that a lower inventory conversion period tends to bring about an increase in firm value. A reduction in inventory conversion period by 1 day tends to lead to a significant increase of 0.983 units in firm value at a 1 percent level of significance. This means by achieving a reduced number of days for inventory conversion by 1 day, the firms tend to achieve an increase of 0.98 units in firm value of shares. These results confirmed Oseifuah & Gyekye (2017) that inventory conversion period had negative connections with corporate profitability but

contradicted Olaoye *et al.* (2019) that inventory period had a positive impact on return on assets. Again, only financial

In addition, we examined the moderating role of finance cost in the relationship between working capital and firm value. POLS, FE, and RE estimations were also performed as customary with panel data regression, and subjected to some diagnostics tests. To test the main hypothesis, finance cost was interacted with cash conversion cycle and working capital turnover ratio, and the two interaction terms were included in the initial model as model 4 whose estimates were presented in Table

8. POLS results showed a significant negative effect of finance cost-cash conversion cycle interaction term on firm value at a 5 percent level of significance level. However, the results were only valid where the selected firms were undifferentiated.

leverage had a significant positive impact on firm value.

Due to the outcome of the heteroscedasticity (Levene) test results the OLS results could not be relied on. We proceeded to estimate both the FE and RE models and the Hausman test results revealed that RE estimates were more reliable at more than 95 percent confidence level. In the RE estimates, finance cost was not only found to have a significant negative effect on firm value, it also moderated the significant negative effect of cash conversion cycle. The results showed that a decrease of 1 percent in finance cost tends to lead to a 2.61 unit increase in firm value. This result confirmed Fizza & Mirza's (2021) position that finance cost had a negative association with investment decisions of firms and firm value.

Table 8. Moderated Regression Analysis Results

| Variables | Model 4 | | | Model 5 | | |
|------------|----------|----------|----------|----------|-----------|-----------|
| | POLS | FE | RE | POLS | FE | RE |
| <i>ICP</i> | - | - | - | -0.981** | -0.961*** | -1.034*** |
| | - | - | - | (0.462) | (0.341) | (0.314) |
| <i>RCP</i> | - | - | - | -0.542* | 0.0411 | -0.0201 |
| | - | - | - | (0.285) | (0.219) | (0.206) |
| <i>PPP</i> | - | - | - | 0.382 | 0.0966 | 0.142 |
| | - | - | - | (0.358) | (0.208) | (0.282) |
| <i>CCC</i> | -0.174 | -0.0816 | -0.0823 | - | - | - |
| | (0.0250) | (0.188) | (0.144) | - | - | - |
| <i>WCT</i> | 0.552 | 0.255 | 0.346 | - | - | - |
| | (0.0018) | (0.0054) | (0.0061) | - | - | - |

| | | | | | | |
|-----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| <i>WAC</i> | 0.0518 (0.0247) | 0.0282 (0.0151) | -0.0261* (0.0180) | -0.0296 (0.0203) | 0.0114 (0.0184) | 0.00560 (0.0106) |
| <i>ICP*WAC</i> | - | - | - | -0.0164 (0.0002) | 1.62e-02 (0.0002) | 6.02e-05 (0.0002) |
| <i>RCP*WAC</i> | - | - | - | -4.82e-03 (0.0003) | -3.86e-03 (0.0002) | -4.68e-03 (0.0002) |
| <i>PPP*WAC</i> | - | - | - | 0.0380 (0.0002) | 6.58e-03 (0.0001) | 0.0115 (0.0002) |
| <i>CCC*WAC</i> | -0.0426** (0.0002) | -7.15e-05 (0.0001) | -0.0131** (0.0001) | - | - | - |
| <i>WCT*WAC</i> | -0.0364 (0.0003) | -0.0246 (0.0002) | -0.0265 (0.0002) | - | - | - |
| <i>FSZ</i> | -0.280 (0.190) | -1.335** (0.501) | -0.477 (0.385) | -0.383* (0.434) | -1.256** (0.501) | -0.517 (0.380) |
| <i>LEV</i> | 1.568*** (0.308) | 2.465*** (0.404) | 2.341*** (0.327) | 1.472*** (0.321) | 2.468*** (0.401) | 2.461*** (0.303) |
| <i>Constant</i> | 3.881** (1.644) | 11.26** (4.501) | 4.806 (2.533) | 8.641*** (3.113) | 13.27*** (4.306) | 6.416** (3.202) |
| Observations | 240 | 240 | 240 | 240 | 240 | 240 |
| Adj. R-squared | 0.198 | 0.198 | | 0.234 | 0.241 | |
| Firm effect | No | Yes | Yes | No | Yes | Yes |
| Time effect | No | No | No | No | No | No |
| F-test | 6.573 | | | 5.986 | | |
| Prob.>F | 5.55e-06 | 3.32e-05 | 1.81e-04 | 2.18e-06 | 7.46e-06 | 9.41e-08 |
| No. of firms | 20 | 20 | 20 | 20 | 20 | 20 |
| Hausman Test | | | 11.66 | | | 6.35 |
| Prob.>F | | | 0.0638 | | | 0.4471 |

Source: Authors' Computations using Stata 15.0, 2024. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

In addition, results of the interaction term consisting of finance cost and cash conversion cycle showed a significant

Table 9. Levene’s Heteroscedasticity Test Results

| Model 4 | | |
|----------------|--------------|---------------------|
| W0 = 4.354 | df (23, 216) | Pr > F = 0.00000009 |
| W55 = 2.564 | df (23, 216) | Pr > F = 0.00041052 |
| W10 = 3.341 | df (23, 216) | Pr > F = 0.00001873 |
| Model 5 | | |
| W0 = 4.721 | df (23, 216) | Pr > F = 0.00000000 |
| W55 = 3.362 | df (23, 216) | Pr > F = 0.00001615 |
| W10 = 4.422 | df (23, 216) | Pr > F = 0.00000124 |

Source: Authors’ Computations using Stata 15.0, 2024.

negative impact on firm value ($\beta=-0.131$, $p=.01$) indicating that finance cost was a good moderator and an important factor in enhancing firm value. This was the position earlier held by Ibrahim & Badara (2020) who analyzed the moderating effect of finance cost in the relationship between equity financing and firm value, using data collected from 12 listed industrial goods firms in Nigeria covering the period 2006 to 2016. So, finance cost significantly moderated the effect of cash conversion cycle on firm value. With low finance cost, the negative impact of long cash conversion cycle will tend to reduce.

In all the models, working capital turnover ratio, as a measure of working capital, did not have any significant effect on firm value while financial leverage had a significant positive effect. It is therefore important that managers of these firms should source for funds in a manner that reduces cost and finance risk. When cash conversion cycle was decomposed into

inventory conversion period, receivables collection period, and payables payment period, only inventory conversion period was found to have any significant negative effect on firm value, as reported under model (5) in Table 9. Moreover, the interacting effect of finance cost on all the components of cash conversion cycle did not have any significant influence.

Conclusions and Recommendations

This study investigated the moderating effect of finance cost in the nexus between working capital and firm value using firmlevel data over 2011-2022. Based on our findings, we can reasonably conclude that efficient cash conversion cycle and short inventories conversion cycle are responsible business practices for enhancing the value of manufacturing firms and that finance cost is a good moderator of any negative influence of long cash conversion cycle on firm value. With a low finance cost, the predictive

ability of cash conversion cycle on firm value is enhanced. Therefore, managers should shorten their cash conversion cycles by requesting advance deposits, by billing as soon as sales information comes in, and offering discounts to encourage early receivables collection.

The findings of this study supported the resource-based view theory, which posited that firms should have access to all resources, which they can invest in working capital and manage optimally for value creation. The means of achieving this is by ensuring low finance cost and monitoring of working capital components. This study demonstrated that even in the presence of a high net working capital period, low cost of financing tends to enhance firm value. The negative effect of cash conversion cycle on firm value meant that it took longer to settle suppliers than it took to sell inventory and collect cash, which showed that the firms relied on suppliers to finance their operations.

However, the positive effect of the cash conversion cycle showed the possibility that the firms injected more funds into the firms as they grew. This study further demonstrated that a faster cash conversion cycle tends to improve firm value and that a lower finance cost, combined with a faster cash conversion cycle, as a working capital strategy, enhanced firm value. It further showed that a shorter cash conversion cycle can be achieved through reduced inventory conversion cycle, and receivables payment period as well as controlling accounts payable period by optimally negotiating better payment terms with suppliers. In addition, there is a need to keep the overall finance cost to its barest minimum.

Contrary to the popular belief that funds for non-current assets should come from longterm sources, while funds for financing working capital should come from shortterm sources, the focus of financial managers should be more on the risk preferences of the management since higher financial leverage significantly leads to higher firm value. Risk-neutral management should employ hedging; and risk-averse management should be conservative while risk-taking management should be proactive in contracting debt financing. In addition, there should be a balance between firm value and liquidity by minimizing cost of liquidity and illiquidity when determining the optimal level of working capital.

A notable limitation of this study is the paucity of data from all manufacturing firms listed on the NGX. This limited our sample to the firms operating in industrial goods and consumer goods only and the data was restricted to 2011-2022. This inhibited the extent of generalization of the findings of this study to all manufacturing firms in other sectors. In the same vein, the period covered could not be extended downward below the base year because of the unavailability of audited accounts for all the selected firms for the prior years.

Moreover, the factors considered in this research solely comprised firms' internal environment that is, firm-specific variables.

External factors or macroeconomic variables such as gross domestic product (GDP), interest rate, infrastructures, developments in the financial markets, and inflation rate, which have a vital impact on investment decisions and funds allocation, should be included in future studies. This

is because firm value can be influenced by all these exogenous factors, too. They can also erode the effectiveness of policies on working capital.

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