

The Impact of Working Capital Management on Firm's Profitability: Evidence from Selected Quoted Multi-Sectoral Firms in Nigeria

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Abstract

The primary objective of this study is to investigate the impact of working capital management on the profitability of twenty quoted multi-sectoral firms in Nigeria. The data used for this study was extracted from the annual report and financial statements of twenty quoted firms in our sample for the period of fifteen years (2005 - 2020) cutting across petrochemicals, publishing, food & beverages, manufacturing, pharmaceuticals and hospitality. The authors utilised the random-effects generalized least squares econometric technique to analyse the data collected from 2005-2020. Findings shows that an increase in the debt conversion period of multi-sectoral firms yields a reducing effect on the profitability of selected quoted multi-sectoral firms in Nigeria. Furthermore, an increase in the inventory conversion period yields a reducing effect on profitability of selected quoted multi-sectoral firms in Nigeria, while an increase in creditors' conversion period had no significant effect on the profitability of selected quoted multi-sectoral firms in Nigeria. A projected increase in the speed of the cash conversion cycle yields an increasing effect on the profitability of selected quoted multi-sectoral firms in Nigeria. Policy recommendations are proffered herein.

Keywords: *inventory conversion period, cash conversion cycle, debt conversion period, working capital management, leverage, multi-sectoral firms, Nigeria.*

I. Introduction

The underlying mystery of the topic under investigation stems from its origin in corporate finance under the auspices of the firm and the major crucial decisions inherent. The manager is faced with a dilemma in the face of investment decisions and financing decisions. Proper conceptualisation eases understanding of the readership on the roots of the topic under investigation. Investment decisions hovers holistic arrangements pertaining the level of investment in fixed assets and current assets which may be short-term or long-term, in the case of long-term, it is classified under the ambit of capital budgeting decisions characterised by a huge amount of long-term investments, in the case of short-term, investment decisions with a shorter tenor is classified under the ambit of working capital decisions which encompasses decisions about the levels of cash, inventory and receivables. Financial decisions, similar in time structure with investment decisions but differs in that long-term decisions hovers equity and debt financing whereas short-term financing decisions hovers funding of working capital needs. Moussa (2018) asserted authoritatively that in the realm of financial decisions, massive attention in financial management literature is vested on the

long-term financial decisions ranging from capital structure rationing and dividend. Despite the importance of working capital on a day-to-day operation of a business, less attention is given to the management of working capital by researchers.

The state of academic literature on the above topic is mixed and contradicting; the impact of working capital management on firms' profitability and value is divided across two sides summarized briefly; the first school posits that increase in the level of working capital translates to increased performance and higher firm value (Azeez, et al. 2016; Malik & Bukhari, 2014), on the other hand, the opposing school posits that firms with lower investment in working capital are associated with greater performance levels and greater shareholder value (see Falope & Ajilore, 2009; Sharaf & Haddad, 2015). Furthermore, the trade-off between liquidity and profitability raises substantial doubts on the level of working capital employable to maximise profitability and reside within safe levels of liquidity. Firms adopt three major approaches in managing working capital and are stated thus; conservative, aggressive and moderate (Ukaegbu, 2014). The conservative approach is a major focus on long-term sources of finance for its operations and resort to short-term in urgent situations. On the other hand, the aggressive approach involves a smaller proportion of current assets i.e. cash, inventories and trade receivables compared to the proportion of total assets. A moderate approach is a sweet blend between the aggressive and conservative approaches. A moderate approach, however, makes a distinction between fluctuating current assets and permanent current assets positing that short-term sources of finance should be adopted to finance fluctuating current assets whereas long-term sources of finance should be used to finance permanent current assets.

The industry within which a certain firm operates determines to a greater extent the amount of working capital and with an extension to the credit days allowed by creditors and credit days given to debtors, and the level of stock they need to maintain (Kosgey & Njiru, 2016). Working capital management and its impact differs from industry to industry, hence, generalisation may be erroneous or insufficient. The context in which the problem with WCM at firm-level is presented lies in the underlying variables such as cash conversion cycle, average payment period, inventory conversion period, account collection period and debt conversion period. Salman, et al. (2014) using cash conversion cycle as a measure of working capital management found that increase in cash conversion cycle reduces the performance of manufacturing firms in Nigeria. Ukaegbu (2014) posited that increase in cash conversion cycles leads to a significant decline in firms' profitability in Nigeria, Egypt, Kenya & South Africa. Evidence for Turkish manufacturing firms reside in the study of Samiloglu & Akgun (2016) posits that increase in account receivable period reduces firms' performance. Distinctive evidence is found in the study of Mbawuni, et al. (2016) showing that cash conversion cycle wields no significant impact on profitability of petroleum retail firms. There is still an unsettled debate on the impact of working capital management on performance of multi-sectoral firms in single-country based studies. Hence the contribution of this study to the body of knowledge is itemized thus; a) Investigate the impact of working capital management on the profitability of twenty quoted multi-sectoral firms in Nigeria b) adopt a different dependent variable (gross profit margin) to measure profitability which is absent from previous studies.

II. Review of Related Literature

Working capital is central to the solvency and liquidity of every firm. In the corporate setting, it is considered an integral part of the operating capital. By way of definition, working capital (WC) encapsulates a financial metric which symbolises operating liquidity available to a business, organization, or other entity. In the form of calculation, working capital is chiefly given as current assets minus current liabilities. In the case of current assets being less than current liabilities, an entity is said to have a working capital deficiency, which can also be described as a working capital deficit and negative working capital.

There are some notable theories of both working capital management and profitability. However, this study will anchor its theory on the **Risk and Return Theory**. Arguably, many scholars see the risk and return theory as one of the most important theories in the field of portfolio management. According Mukherji, Desai & Wright (2008), the risk and return theory has to its credit commanded tremendous reviews from researchers in business, economics and finance. Relatedly, in any business or other entities, every decision with respect to investment is based on risk and return relationship (Richard, Stewart & Franklin, 2008). Relating to that, two conflicting attitudes are always associated with the risk. That is, the risk-seeking behavior and the risk aversion. Risk seekers always prefer choices involving a higher potential loss / or a greater probability of a loss and of course with a strong notion of over estimating gains. The main focus of risk-seekers is on the opportunities for gain (Tiegen & Brun, 1997). Conversely, risk-averters are completely opposite of risk seekers, in the sense that they (risk averters) over estimate losses and underestimate gains.

This can effortlessly be linked with our study, relating to working capital management and profitability. Firstly, for us to factor in the risk and return theory in working capital management, it is expedient to posit that one of the fundamental decisions in working capital management is the trade-off between liquidity and profitability. This trade-off is the main crux of the working capital management and profitability relationship. In this instance, should a firm elects to be liquid it should be at the cost of the profit and vice-versa. Any of these two competing decisions may result in either of excess or shortage of the components of working capital and the current assets of a business. Thus, excess liquidity is considered as nonearning and this reduces profitability. On the other hand, its shortage causes crisis in liquidity which results in inability to make payments, disruption of operations, and ultimately affects profit. In another case evidence, in the case of account receivable being in excess, will be associated with collection effort costs, risk associated with defaults and low profit. Invariably, turnover will be low, and so the profitability of the entity. In like manner, Inventory Price decline, associated carrying costs, opportunity cost of funds. These affect profit adversely. Limited supplies, tends to interrupt production schedules, lower sales as well as profits.

As noted by Yusuf and Nasruddin (2015), the risk and return theory which is an integral part of the portfolio theory can be associated to working capital when we look inwardly at the ability of a firm or financial manager to determine the collection of assets, or portfolio to be acquired, since it is impossible to own everything, decisions on what the composition of receivables, inventories, incentives and stocks viz-a-viz the profitability concern are all within the context of risk and return theory.

Ukaegbu (2014) examined the relationship between working capital efficiency and corporate profitability and in particular, to determine their significance across countries with differential industrial levels. Findings revealed that there is a strong negative relationship between profitability, measured through net operating profit, and cash conversion cycles

across different industrialisation typologies. The negative association implies that, when the cash conversion cycle increases, the profitability of the firm declines. Ikpefan, et al. (2014) empirically investigated the relationship between working capital management and profitability using Nestle Nigeria Plc and Cadbury Nigeria Plc as case studies. The authors relied on correlation and regression as its main econometric tools for analysis. Findings showed that a negative relationship between the liquidity, two of the efficiency ratios and return on equity for Nestle Nigeria Plc while it found a positive relationship between the liquidity, efficiency ratios and return on equity of Cadbury Nigeria Plc. Umoren & Udo (2015) investigated the impact of working capital management on the liquidity and profitability of selected deposit money banks in Nigeria. The scholarly duo relied on Pearson correlation and ordinary least squares as its main econometric tools to answer central research questions raised. The findings showed that there is significant positive relationship between banks' performance and bank size; there is a significant negative relationship between profitability and cash conversion cycle and leverage; there is a significant negative relationship between liquidity and creditors' payment period and leverage; and there is a significant positive relationship between liquidity and debtors' collection period, cash conversion cycle and credit risk.

Mbawuni, et al. (2016) examined the impact of working capital management (WCM) on the profitability of petroleum retail firms (PRFs) in Ghana over a six year period (2008-2013). The scholarly trio adopted correlation and OLS as the main econometric tools for onward analysis. Findings showed that the most important component of working capital that drives firms profitability is average days payable. On the other hand, cash conversion cycle (CCC), average days inventory (ADI) and average days receivables (ADR) had no significant impact on profitability of petroleum retail firms in Ghana. Evidence from Nigerian food product firms resides in the study of Sabo, et al. (2015), the scholarly quintet adopted Generalised Least Squares as its main econometric tool. Main research aim was to examine the impact of working capital management on corporate profitability through the periods of 2008 to 2012. Findings showed that increase in Average Collection Period (ACP), Current Ratio (CR) and the size of the firm (LOGSIZE) prompts a proportional increase in firms' profitability. On the other hand, increase in Inventory turnover period and average payment period decreases the profitability of Nigerian food product firms. Salman, et al. (2014) investigated the relationship between working capital management on organizational profitability in Nigeria with special reference to manufacturing companies quoted in Nigerian Stock Exchange. The data used for this study was derived from the audited financial statements of twenty manufacturing firms listed on the Nigerian Stock Exchange (NSE) from 2005 – 2013. Findings showed that working capital has negative and significant relationship with the Return on Assets (ROA) and Return on Equity (ROE) at 5% level. This implies that increase in working capital reduces the performance of manufacturing firms in Nigeria. Akindele & Odusina (2015) examined the relationship between working capital management and firms' profitability of twenty-five Nigerian quoted companies from 2005-2011. Output from the multiple regression analysis showed that working capital management reduces firm profitability.

Angahar & Alematu (2014) empirically examined the impact of working capital management on profitability (measured by return on assets- ROA) of Nigerian Cement Industry for a period of eight (8) years (2002- 2009). The study found an insignificant negative relationship between the profitability (measured by ROA) of cement companies quoted on the NSE and the number of days accounts receivable are outstanding (DAR). The study also found a significant negative relationship between the profitability of these cement companies and the

number of days inventory are held (DINV). The study finally revealed a significant positive relationship between the profitability and the cash conversion cycle (CCC). The study concludes that, the profitability of cement companies quoted on the NSE during the study period is influenced by DINV and CCC.

International Evidence

Malik & Bukhari (2014) investigated the impact of working capital management (WCM) on corporate performance in cement, chemical and engineering sectors of Pakistan. WCM measures include average age of inventory, average collection period, average payment period, operating cycle, and the cash conversion cycle whereas return on equity is used as a measure of firm performance alongside leverage and firm size acting as control variables. Findings showed that increase in average payment period reduces firm performance, whereas, increase in speed of the cash conversion cycle increases firm performance. Furthermore, average collection period, average age of inventory and operating cycle had no significant impact on firm performance in the case of tri-sectors in Pakistan. Samiloglu & Akgun (2016) examined the link between working capital management and firm performance using measures such as accountant receivable period, accountant payable period, cash conversion cycle, return on equity and return on asset on Istanbul Stock Exchange (ISE) during the last ten years. The findings of this paper show a significant and negative relationship between account receivable period and return on asset, return on equity, operating profit margin and net profit margin in the manufacturing industry in Turkey. Usman, et al. (2017) examined the impact of working capital management (WCM) on firm's profitability in Denmark, Norway and Sweden from 2003-2015. After controlling aforesaid indicators, authors found an adverse impact of inventory days (IDs), receivable days (RADs), payable days (PADs), and cash conversion cycle (CCC) on firm's profitability (ROA). These findings are in line with those of Sharma and Kumar (2011), who found that WCM and performance correlated positively in Indian firms. In contrast, Azam and Haider (2011) employed a canonical correlation methodology for a sample of 21 non-financial institutions of the KSE-30 index in Pakistan. They found that managers maximized shareholder value and firm performance by reducing their inventory levels, CCC, and NTC. These results are also in line with the findings of previous studies conducted in different Asian markets such as Pakistan, India, Malaysia, and Vietnam. These studies reported a negative relationship between CCC and firm performance (Dong and Su 2010; Iqbal and Zhuquan 2015; Mohamed and Saad 2010; Raheman et al. 2010; Raheman and Nasr 2007; Singhania et al. 2014; Zariyawati et al. 2009).

In the study of Uyar (2009), he examined industry benchmarks for Cash Conversion Cycle (CCC) of merchandising and manufacturing companies in Turkey and found that merchandising industry has shorter CCC than manufacturing industries. He further examined the relationship between the length of the CCC and the size of the firms and the findings indicated a significant negative correlation between the length of CCC and the firm size, in terms of both net sales and total assets. The study further showed significant negative correlation between the length of CCC and the profitability. Rehman (2006) investigated the impact of working capital management on the profitability of 94 Pakistani firms listed at Islamabad Stock Exchange (ISE) for a period of 1999 – 2004. He studied the impact of the different variables of working capital management including average collection period, Inventory Turnover in days, Average Payment period and Cash Conversion Cycle on the net operating profitability of firms. He concluded that there is a strong negative relationship between working capital ratios and profitability of firms. Furthermore, managers can create a positive value for their shareholders by reducing the cash conversion cycle up to an optimal

level. Gill et al. (2010) analyzed the impact of various WCM measurements, including CCC, accounts receivables period (ARP), inventory period (IP), and accounts payable period (APP), on the profitability of US companies. They found that a firm's profitability is positively related to CCC and negatively related to ARP, whereas a firm's profitability is not significantly affected by IP and APP. These findings indicate that profitable companies pay less attention to WCM and have longer CCC compared to less profitable firms. Vural et al. (2012) explored the impact of WCM on the profitability and market value of listed firms in Turkey and reported a negative association between CCC and firm value. Finally, based on data from European markets, Banos-Caballero et al. (2014) investigated the impact of WCM on the value of 258 unlisted UK firms. Their results showed a nonlinear association between WCM and firm value. These results imply the existence of optimal working capital levels (i.e., NTC length) that maximize a firm's value.

III. Methodology

Data and Model Building

The data used for this study was extracted from the annual report and financial statements of twenty quoted multi-sectoral firms in our sample for the period of fifteen years (2005 - 2020) cutting across petrochemicals, publishing, food & beverages, manufacturing, pharmaceuticals and hospitality. The model adopted is a dire improvement of the model utilized in Salman, et al. (2014) and Angahar & Alematu (2014) positing outstanding novelty and academic value to the age-long discourse between working capital management variables and firm profitability. A distinguishable feature of the model lies in the slight modification made with the introduction of Gross Profit Margin as the dependent variable as opposed to the generic patronage of ROAA and ROAE by a multiplicity of authors as a measure of firms' profitability. The technique of analysis adopted to test the study model is random-effects generalized least squares econometric technique.

$$GPM_t = f(DCP, ICP, CCP, CCC, FS, LEV) \dots\dots\dots (1)$$

From the above equation 1, we can further specify our model as follows:

Econometric Model:

$$GPM = \beta_0 + \beta_1 DCP_{it} + \beta_2 ICP_{it} + \beta_3 CCP_{it} + \beta_4 CCC_{it} + \beta_5 LEV + e_{it} \dots\dots\dots (2)$$

Where:

- GPM: Gross Profit Margin
- DCP: Debt Conversion Period
- ICP : Inventory Conversion Period
- CCP: Creditor's Conversion Period
- CCC: Cash Conversion Cycle
- LEV: Leverage
- Bo : Intercept
- $\beta_1, \beta_2, \beta_3, \beta_4$: coefficients of the parameter estimate;
- e: Stochastic error term
- A-priori expectations: $\beta_1 < 0; \beta_4 < 0$

IV. Results and Discussion

Descriptive Statistics

Table 1: Table showing the descriptive statistics for GPM, DCP, ICP, CCP, CCC, and LEV.

Variables	Mean	Std. Dev.	Maximum	Minimum	Observations
<i>GPM</i>	45.95	38.95	81.50	5.40	300
<i>DCP</i>	56.50	45.50	128.20	1	300
<i>ICP</i>	252.19	323.90	988.00	7.00	300
<i>CCP</i>	66.25	55.35	179.6	8.00	300
<i>CCC</i>	138.51	148.90	301.7	-12.9	300
<i>LEV</i>	0.5	0.1	0.9	0.1	300

Source: Authors Computation

There is presence of extreme values in the dataset leading to the scenario where standard deviation computed is greater than the mean ($SD > \text{mean}$). In Table 1, ICP and CCC recorded a high standard deviation depicting that data points are farther from the mean while other variables (DCP, GPM and CCP) did not record such abnormal scenario. LEV's standard deviation tilts towards zero which is perfectly fine statistically. The maximum value in the dataset is ICP (988.00) while the minimum value is LEV (0.9).

Unit Root Test

The author employed the Levin, Lin and Chu unit root test to ascertain the stationarity of variables employed in the study's model. The results contained in Table 2 shows that all variables except LEV are stationary at level while LEV is stationary after first difference. Econometrically, all variables such as GPM, DCP, ICP, CCP, and CCC are integrated at order zero I (0) while LEV is integrated at order one I (1).

Table 2: Results showing unit root tests for GPM, DCP, ICP, CCP, CCC and LEV.

Variables	Coefficient	T-ratio	p-value	Order of integration
GPM	-1.0733	-6.587	0.0012*	I(0)
DCP	-0.8347	-7.129	0.0332*	I(0)
ICP	-1.1445	-6.198	0.0000*	I(0)
CCP	-5.0453	-6.587	0.0012*	I(0)
CCC	-0.9331	-7.129	0.0332*	I(0)
LEV	-1.5432	-6.198	0.0000*	I(1)
Levin, Lin & Chu (2002) test. * denotes significance at 5% level				

Source: Authors computation.

Regression Analysis

Table 3.0: RE-GLS Regression with AR (1)

GPM	COEFFICIENTS	STD. ERROR	Z	P >[Z]
DCP	-0.0653	0.0364	-1.79	0.073
ICP	-0.0398	0.0195	2.04	0.041
CCP	0.0105	0.0559	1.87	0.070
CCC	0.0535	0.0302	1.77	0.045
LEV	0.0139	0.0076	1.82	0.069

Source: Authors Computation.

Discussion of Results

Perusing the reported figures in table 3.0, there is an extant need to interpret coefficients and make research findings known in perfect alignment with research questions raised in the introductory part of this research. The researcher employed DCP (Debt conversion period), ICP (Inventory conversion period), CCP (Creditors conversion period), CCC (Cash conversion cycle) and LEV (Leverage) to explain variations in the profitability of selected multi-sectoral firms listed on the Nigeria Stock Exchange. The researcher also intends to gauge findings with the set a-priori expectations as spelt out in this study's methodology section.

To increase the reliability of results, the researcher employed a distinct measure of performance scarcely used in available literature on the topic under review; GPM (Gross profit margin) and gauge the effect of explanatory variables on the chosen dependent variable. Findings from table 3.0, suggest that increase in the debt conversion period of multi-sectoral firms yields a reducing effect on the profitability of selected quoted multi-sectoral firms in Nigeria. Furthermore, an increase in the inventory conversion period yields a reducing effect on profitability of selected quoted multi-sectoral firms in Nigeria, while an increase in creditors' conversion period had no significant effect on the profitability of selected quoted multi-sectoral firms in Nigeria. A projected increase in the speed of the cash conversion cycle yields an increasing effect on the profitability of selected quoted multi-sectoral firms in Nigeria. Debt conversion period aligned with a-priori expectations in the study model and also significant at 5%. Inventory conversion period aligned with set a-priori expectations was negatively signed in the study model and significant at 5%. Cash conversion cycle also aligned with set a-priori expectations and negatively signed alongside significance at 5%. The results obtained depicts the issues existing within the realm of working capital management for production firms. Pertaining inventory conversion period, an increase in the length of the ICP possesses an adverse effect on projected sales, production time, raw material hiccups, production runs and overheads for the selected firms. The shorter the inventory conversion period the better for the chances of stock availability and rapid supply of finished goods along the various distribution channels. The period the business takes to pay its creditors must be within prescribed and agreed limits to retain its ascribed creditworthiness, ratings, goodwill and regulatory pass marks. Further lingering in the CCP may send warning signals to business creditors on intending business failure. Depending on the nature of business, customers may take goods on credit, part-payments or other recognized arrangements. Conversion of various customers' debt into cash may aid working

capital or investments for further expansion of the business. The model estimations in Table 3.0 is free from the problem of auto-correlation and heteroskedasticity.

V. Summary of Findings, Conclusion and Recommendations

This section recapitulates peculiar findings from this study emanating from the testing of hypotheses raised in the course of this study. Conclusions and recommendations are in line with the research findings.

After estimation of data collected by the researcher from the audited financials of selected firms across sectors of interest in Nigeria produces the following set of findings. Prior to elicited presentation, there is need to restate the primary objective of this study, which is to investigate the impact of working capital management on the profitability of twenty quoted multi-sectoral firms in Nigeria.

Debt conversion period possesses a negative and significant impact on the profitability of selected multi-sectoral firms in Nigeria for the period under review. The above finding contrasts with the reported findings contained in Sabo, et al. (2015) but aligns with the findings of Uyar (2009), Malik & Bukhari (2014), Samiloglu & Akgun (2016) and Usman, et al. (2017). Inventory conversion period yields a reducing effect on profitability of selected quoted multi-sectoral firms in Nigeria. Comparing results with other published empirical analyses on this subject matter sees our ICP result deviate from the findings of Gill, et al. (2010), Angahar & Alematu (2014) and Mbawuni, et al. (2016) where the increase in ICP reduced profitability of the selected multi-sectoral firms and other studies reported no significance in their analyses.

Likewise, we found out that an increase in creditors' conversion period had no significant effect on the profitability of selected quoted multi-sectoral firms in Nigeria. The above finding contrasts with the finding of Sabo, et al. (2015) and Usman, et al. (2017). Cash conversion cycle yields an increasing effect on the profitability of selected quoted multi-sectoral firms in Nigeria. This findings deviates from the findings of Uyar (2009), Azam and Haider (2011), Ukaegbu (2014), Umoren & Udo (2015), and in consonance with Malik & Bukhari (2014) and Angahar & Alematu (2014). Other studies that reported a negative relationship between cash conversion cycle and firm profitability includes (Dong and Su 2010; Iqbal and Zhuquan 2015; Mohamed and Saad 2010; Raheman et al. 2010; Raheman and Nasr 2007; Singhania et al. 2014; Zariyawati et al. 2009). However, Mbawuni (2016) reported no significant relationship between cash conversion cycle and firm profitability in the case of Ghana.

Policy Recommendations

Senior management in the selected multi-sectoral firms adopted as study sample in this academic masterpiece must concentrate and create strategies that reduces the length of debt conversion period and inventory conversion period as it has a direct adverse impact on working capital and gross profit. There is also an extant need to update production method and machinery to facilitate faster production in shorter periods to maintain stock levels.

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