WORKING CAPITAL MANAGEMENT AND FINANCIAL PERFORMANCE: EVIDENCE FROM SELECTED NIGERIAN MANUFACTURING FIRMS

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Abstract
The aim of this study was to determine the relationship between components of working capital and financial performance of selected Nigerian manufacturing firms. The ex-post facto research design was adopted and six companies were purposively selected for the period 2013-2020. Data was collected from the annual reports and accounts of the sampled companies and tested by means of fixed and random effects panel data estimation tool. Findings indicated that average payment period had a significant positive relationship with return on investments, while inventory turnover period had a significant negative relationship with return on investments. Also, average collection period had a significant negative relationship with return on investments. Given the findings, it was concluded that working capital management significantly influence financial performance of manufacturing companies. The study therefore recommends that manufacturing companies should ensure optimal mix of working capital proxies in order to optimize financial performance.
Keywords: Working capital management; Financial performance; Return on investments; Average payment period; Average collection period; Inventory turnover period

Introduction

Working capital is as old as business itself and is considered an everyday affair in the scheme of business. It is an ingredient that a business cannot do without, particularly in an era of economic downturn. Working capital is a financial metric which shows the operating liquidity available to a business and governmental entities. Alongside with fixed assets, such as plant and equipment, working capital is considered a part of operating capital. Adeniji (2008) sees working capital as the capital available for conducting the day-to-day operations of organizations represented by its net current assets.

The working capital is the life blood and nerve center of a business firm. It refers to firms' investment in short-term assets or current assets. Current assets are assets that can be converted into cash within an accounting year. Similarly, Akinsulire (2008)

refers to working capital as the items that are required for the day-to-day production of goods to be sold by a company. Thus, working capital is the life-line of the business and requires deliberateness on the management to manage their working capital if the business must thrive and survive.

The management of working capital involves the management of current assets of the business which involves cash, stocks and the like. Current assets are managed so that the firm does not come to debt with its current liabilities exceeding its current assets. This debt could occur when a firm takes more risk by investing, but it is a known fact as seen in the risk and return theory that the more is the risk the more the return. This means that, the business will make more profits if it takes more risk by investing but will also exercise caution so that it does not come to debts, neither have to go borrowing to carry out its day-to-day activities, thus the need for management of working capital.

Working capital management requires maintaining optimum balance of receivables, inventories and payables, with the resultant effects on the day-to-day operations of the business (Kolapo, Oke & Ajayi, 2015). Eljelly (2004) stated that working capital management involved planning and controlling current assets and current liabilities in a manner that eliminates risk of inability to meet short-term obligations on one hand and avoid excessive investments in these assets on the other hand. This therefore underscores that efficient management of working capital is very important because it impacts on firms' profitability (Saptarshi, 2018).

It has been well established that return on investment is one of the most predominant profitability ratio (Encyclopedia 2019). However, its use in literature, particularly in area of working capital management and financial performance researches has been scarce Nzewi (2007) referred to the return on investments as earning power which provides an index for determining how the management has utilized the assets of the company to generate profits.

Prior studies have shown that a relationship exists between working capital management and financial performance (Lawrence, 2015; Taghizadeh, Ghanavati, Akbari & Ebrati, 2012; Hiram & Willy, 2017; Erin, Okoye, Modebe, Achugamonu & Ado, 2016; Rathiranee & Sankeetha, 2010; and Aloy, 2012). Most studies attempt to view working capital management from a perspective and not in isolation, but as it relates to firm performance or financial performance as the case may b (Ironkwe & Wokoma, 2017; Samuel & Fidelis, 2015;, Ogodor & Mukolu, 2015; Micheal, 2012; and Yusuf, 2014).
Again, most studies on the relationship between working capital management and financial performance provides mixed findings and were carried out in other sectors of the Nigerian economy. This therefore necessitated the researchers to study the consumer goods manufacturing sector, stratifying the companies into groups, to

ensure full representation of each. Furthermore, the use of return on investment to proxy financial performance in this sector was used as this will add to literature, being that it was scarcely used for the previous empirical works reviewed. Consequent upon the above, the following specific objectives were derived:

1. To determine the relationship between average receivable periods and return on investments of selected Nigerian manufacturing firms.
2. To assess the relationship between average payment periods and return on investments of selected Nigerian manufacturing firms.
3. To ascertain the relationship between inventory turnover periods and return on investments of selected Nigerian manufacturing firms.

Literature Review

Working Capital Management

Working capital management has to do with the workings, inter-relations, interactions of the current assets and current liabilities of the firm, in order to make maximum use of the both to achieve the desired goal of the organization, which is geared towards liquidity and profitability. Eljelly (2004) described effective working capital management as the capacity to manage current assets and current liabilities in a way and the firm must be in the position to easily pay of all the uncertain obligations whenever it urgently required. According to Napompech (2012), working capital management refers to the planning and controlling of current assets and current liabilities in a manner that eliminates the risk of inability to meet short-term obligations on one hand and exclude excessive investments in current assets on the other.

Working capital management is an accounting strategy focusing on maintaining efficient levels of current assets and current liabilities in respect to each other. Vineet and Sukhdev (2013) see working capital management from efficiency perspective and that can be measured and achieved through the cash conversion efficiency, days operating cycle and days working capital. Working capital management is very instrumental to the liquidity and profitability of any organization, which suggest the reason for their being the objectives of working capital management and the two variables are vital in checking the performance and ultimately deciding the survival of the organization.

The place of working capital is an everyday life of the business. Little wonder, it cannot be overemphasized in the literature, as several researchers looked at the concept from different perspectives. The management of working capital embraces inventory turnover, cash conversion cycle, average collection periods, average payment periods, inventory conversion periods, account receivables, net trading cycle, account payables.

Importance of Working Capital Management to the Firm

Working capital management plays a vital role in the operations of the firm. Sen and Oruc (2009) argued that working capital management is consequential to a firm and that it is usually explained in the context of the relationship to the firms; profitability. Currently, the novel COVID 19 pandemic which brought lockdowns and disruptions to business activities also brought to play, the importance of working capital management to the firm. Some myths in working capital management were faced with the reality of the COVID 19 experience. The myths about cash and working capital have been explicitly outlined by KPMG as follows:

Table 2.1: The Myths about Cash and Working Capital

Myth	COVID 19 Reality
"Is solely a finance issue"	…the disruptions of your demand, supply chain and workforce, are the biggest impacts and opportunities
"It only takes only some tweaks to our systems"	… must have cash management processes, governance and tools to create transparency to and manage the drivers of the ins and outs of cash
"Harms customer's service"	… if your company can not manage cash obligations, then your customer loses
"It is easy to improve"	… without creating the visibility and analytics for individual transactions surrounding the sources and uses of cash, it will be nearly impossible to manage
"It is not a strategic priority"	… it is now!

Source: *Compiled by the Research from KPMG Website*

Furthermore, working capital management deals with determination of levels of current assets and ensuring that right sources of funds are tapped to finance current assets as well as make sure that current liabilities are paid in due time. Working capital management entails short-term decisions generally relating to the next one-year period which are reversible. These decisions are not taken on the same basis as capital investment decisions; rather, they are based on liquidity and profitability.

Van-Horne (2005) sees working capital management as the administration of current assets in the form of cash, marketable securities, receivables, staff advances, and inventories. Good working capital management must ensure an acceptable relationship between the different components of a firm's working capital so as to make an efficient mix which will guarantee capital adequacy. Therefore, working capital management should make sure that the desirable quantities of each component of the working capital are available for management. More so, if performance criteria like liquidity, solvency/bankruptcy, efficiency, profitability and economic value are considered, it will be clearly apparent that the business must hold and manage the

different levels of working capital which are appropriate to its performance criteria.

Ajao and Nkechinyere (2012) asserted that working capital management seeks to maintain an optimum balance of each working capital component thereby ensuring that firms operate with sufficient fund that will service their long-term debt and satisfy both maturing short-term obligations and upcoming operational expenses. This therefore makes it more glaring that working capital management has a vital role to play in a firm's drive to achieve improved profitability. Working capital management is concerned with the problem that arises in attempting to manage the current assets, the current liabilities and the inter relationship that exist between them.

Working capital management involves both setting working capital policy and carrying out that policy in the day-to-day operations of the firm. Uremadu, Egbide and Enyi (2012) further explained that working capital management revolves around two basic issues: (a) The appropriate amount of current assets firm will hold and (b) How the current assets should be financed. The first issue is that the consideration of the level of investment in current assets should avoid two danger points; excessive and inadequate investment in current assets. Investment in current assets should be just adequate, not more, not less to the needs of the firm.

Notably, excessive investment in current assets impairs profitability while inadequate investment in current assets threatens the liquidity or solvency of the firm because of its inability to meet its current obligations, hence, the risk-return theory. Managers must therefore endeavor to monitor and appropriately manage the in-balances. The second issue on the other hand, covers the question of judicious mix of long-term and short term funds for financing current assets (Egbide & Enyi, 2012).

From the above propositions, it is clear that working capital management is aimed achieving "an optimum balance between the twin objectives of profitability and liquidity by maintaining an appropriate level, volume, mixture, composition and combination of various components of working capital to ensure that firms have sufficient funds to meet their short-term financial requirements" (Egbide & Enyi, 2012).

Return on Investment

Return on investment is reflected in the efficient management of the company's assets and therefore this makes return on investment as the ultimate test of business success. To obtain return on investment, the total investment is divided by the operating income. The higher the ratio the more returns that accrue to the investors. Companies desire to earn a high return on investment than industrial average, however limited by the fact that in a competitive environment no one firm can significantly influence the product price or industry cost structure.

According to Nzewi (2007), return on investment is an excellent measure of the ability of a firm in successfully husbanding all the resources available to it in generating income for the benefit of all classes of investment in the firm. To proxy performance, the use of return on assets, return on equity, gross profit, net profit have been used by several studies (Soyemi & Olawale, 2014; Owolabi & Alayemi, 2010; and Osundina & Osundina, 2014).

Furthermore, the use of several industries and sectors of the economy also strengthen the fact that the study of working capital management is ongoing, as evidenced in the studies of Ajibolade and Sankay (2013); Onodje (2014); Azeez (2015); Joseph and Amah (2016); and Salman, Folajin and Oriowo (2014) who studies manufacturing firms; Osuma, Ikpefan, Romanus, Ndigwe and Nkwodimmah (2018); Adamu and Hussaini (2015); Serge (2016); and Samuel and Benjamin (2011); who studied banks while Tanveer, Muhammed, Muhammed, Muhammed and Sadaf (2016); Emmanuel (2018); and Naeem, Malik, Muhammed and Mehboob (2014), studied non-financial firms listed on the stock exchange.

Theoretical Framework

The theoretical framework of this study is anchored on the trade-off model. Trade-off model demonstrates that firms decide their optimal level of cash holding by comparing the marginal cost and benefits of holding cash. Large investment in current assets under certainty would mean low rate of return on assets (ROA) of the firm, as excess investments in current assets will not earn enough return. A smaller investment in current assets, on the other hand, would mean interrupted production and sales, because of frequent stock-outs and inability to pay to its creditors in time due to restrictive policy.

Various studies attempted to examine the relationship between working capital management and financial performance which embodied liquidity and profitability as components (Deloof, 2003). The ultimate objective of any firm is to maximize profit. At the same time, preserving liquidity of the firm is an important objective too. The problem is that increasing profits at the cost of liquidity can bring serious problems to the firm (Shin & Soenen, 1998).

The trade-off theory emphasizes that there must be a trade-off between these two objectives of firms. One objective should not be fulfilled at the cost of the other since both are important. If we do not care about profit, we cannot survive for a longer period. On the other hand, if we do not care about liquidity, we may face the problem of insolvency or bankruptcy. The firm must decide about the levels of current assets to be carried for which a firm's technology and production policy, sales and demand condition, operating efficiency is taken into consideration in the policy decision. It may follow a conservative risk-return trade-off.

The rank correlation of liquidity and profitability are said to be inversely related to each other. It implies that as the liquidity increases and profitability decreases (Pandey, 2010).More aggressive working capital approaches are associated with higher return and higher risk while conservative working capital approaches are concerned with lower risk and lower return.

Empirical Review

The study on the relationship between working capital management and financial performance has attracted great attention from both academic and financial practitioner for many years and is still ongoing. Okoye, Erin, Modebe and Achugamonu (2016) on working capital management and the performance of consumer and industrial goods sector in Nigeria, investigated the impact of working capital management on the financial performance of selected companies listed on the Nigerian Stock exchange, specifically, forty (40) Consumer and Industrial goods companies out of the population of fifty-seven (57) for the period of ten (10) years, 2006-2015. Ordinary least squares (OLS) regression method and Pearson Correlation were used for the study. The independent variable was represented by Average Payment Period (APP), Cash Conversion Cycle (CCC), Inventory Conversion Period (ICP) and Average Collection Period (ACP), while the dependent variable was represented by Return on Assets. The findings showed that Cash Conversion Cycle (CCC), Average Payment Period (APP) and Inventory Conversion Period (ICP) showed significant positive impact on Return on Assets (ROA). However, Average Conversion Period (ACP) showed a negative impact on Return on Assets. Also, the control variables adopted in this study (size, growth, leverage and current ratio) have significant impact on financial performance of firms selected for the study.

Also, Kiptoo (2017) studied on working capital management practices and financial performance of tea processing firms in Kenya and investigated the effect of working capital management practices on financial performance of fifty-four (54) Tea Processing firms in Kenya. A sample of forty-eight (48) tea processing firms were used for the research, also primary (in the form of questionnaires) and the secondary source was used to get data. Pearson Correlation, regression and ANOVA analysis were adopted. The independent variable was represented was represented with cash management practices, inventory management practices, receivables management practices and payables management practices, while the dependent variable was represented by return on assets, sales and net profit. The findings of the study indicated that working capital management practices significantly affected the financial performance of tea processing firms, in particular, receivables and inventory management practices had a negative and significant effect on financial performance of Tea Processing firms.

Tanveer, Muhammed, Muhammed, Muhammed and Sadaf (2016) studied on the impact of working capital management on firm's financial performance with

evidence from Pakistan and empirically explored the impact of working capital management on firm's performance of fifty (50) listed non-financial companies as sample, on Pakistani Stock Market for the period of ten (10) years, 2005-2014. The independent variable was represented by Inventory Turnover (ITO), Cash Conversion Cycle (CCC), Average Collection Period (ACP) and Average Payment Period (APP), while the dependent variable was represented by Return on Assets (ROA), Return on Equity (ROE) and Earnings per Share (EPS). Multiple regressions were used and the findings showed that inventory turnover had negative impact on Return on Assets, but Average Collection Period had positive and statistically significant impact on Return on Assets.

Osundina and Osundina (2014) carried out a study on the effect of working capital management on market value of quoted food and beverages manufacturing firms in Nigeria and analyzed the correlation between working capital management and market value of quoted food and beverages manufacturing firms in Nigeria. Twelve (12) food and beverages manufacturing firms were selected with a population of 171 staff, then a sample of 120 was obtained with Taro-Yamane's formula. Pearson Product Moment Correlation and Multiple regression analysis were used to ascertain the relationship between working capital management and market value of quoted food and beverages manufacturing firms in Nigeria. The independent variable was represented by Account Collection Period (ACP), Inventory Conversion Period (ICP), Account Payment Period (APP), Cash Conversion Cycle (CCC) and Aggressive Investment Policy (AIP). Survey research design was employed using primary data. Pearson Product Moment Correlation and Multiple regression analysis were used to determine the effect. The findings were that food and beverages manufacturing firms in Nigeria cannot maximize its profits as well as shareholders' wealth without paying proper attention to the management of various components of its working capital.

Soyemi and Olawale (2014) on comparative analysis on working capital management of Brewery companies in Nigeria examined the cost of working capital and the effect on firm performance and took a critical view of the adopted liquidity measures of the measures of the Nigerian firm and attempted to see how it has been achieved. Guinness breweries and Champion breweries were used for five (5) years, 2009-2013. Secondary data was used and ratio analysis was used to analyze the data collected. The findings were that working capital which amounted an average was higher than all other concerns as followed in Guinness Nigeria and Consolidated breweries. Guinness Nigeria possessed huge amounts of current assets than consolidated breweries. It was also deduced that inventories and debtors were very high in the case of Guinness Nigeria, whereas current liabilities where still on the moderate level except in 2013.

Methodology

The study adopted the ex-post facto research design with a population of all publicly quoted Nigerian manufacturing firms over a period of eight (8) years, (2013 – 2020). Using secondary data, stratified and purposive sampling method was adopted in selecting five (5) firms. Data obtained were analyzed using regression statistical technique. The functional relationship between working capital management and financial performance model is as expressed below:

$$ROI_{it} = \alpha_0 + \beta_1 APP_{it} + \beta_2 ITP_{it} + \beta_3 ACP_{it} + \xi_{it}$$

Where:

ROI	=	*Return on Investment*
APP	=	*Average Payment Period*
ITP	=	*Inventory Turnover Period*
ACP	=	*Average Collection Period*
α_o	=	*Constant term (intercept)*
β_{1-3}	=	*Coefficients to be estimated*
ξ	=	*Error term/unexplained variables.*

Table 3.1: Measurement of Variables

S/No	Variables	Acronym	Measurement	Source
1.	Return on Investment	ROI	$\frac{Net\ Income}{Total\ Investment} \times 100$	Hackenback, 1993; &Ndaman, 2013.
2.	Average Payment Period	APP	$APP = \frac{Average\ Account\ Payable}{Purchase} \times 365\ days$ *Where* $ACR = \frac{(Opening+Closing)\ Account\ Payable}{2}$	Eisenberg et al, 1998 & Allan, 2014.
3.	Inventory Turnover Period	ITP	$ITP = \frac{Average\ Inventory}{Cost\ of\ Goods\ Sold} \times 365\ days$ *Where* $ACR = \frac{(Opening+Closing)\ Inventory}{2}$	Aleef(2011)
4.	Average Collection Period	ACP	$ACP = \frac{Average\ Account\ Recievable}{Turnover} \times 365\ days$ *Where* $ACR = \frac{(Opening+Closing)\ Account\ Recievable}{2}$	Mathuva(2010)

Source: *Author's Compilation (2021)*

4. Presentation, Analysis and Discussion of Findings

Table 4.1 presents annualized averages, annualized standard deviation and other summary statistics on the data sets in the study. The descriptive statistics shows that the average return on investment (ROI), which is the measure of financial performance of the firms, is generally low at 0.06. This implies that firms have made less than desired returns on their investment over the period under review. The median value of the ROI as well as the standard deviation indicates that the ROI values appear to be quite similar across firms and over time. Table 4.1 reveals that the measures of working capital (APP, ITP and ACP) are 14.898, 14.504, and 15.719 respectively on average, with quite low standard deviations, suggesting that the mean value is evenly spread among the firms in the sample. Essentially, this is expected to be quite an interesting working capital management strategy for the companies in the study. Average inventory turnover period for the firms is also 75 days on average, which is generally high for these firms.

Table 4.1: Descriptive Statistics

Variable	Mean	Med.	Max.	Min.	S.D.	Skew	Kurt.	J-B	Prob	N
ROI	0.063	0.065	0.323	-0.530	0.137	-1.440	8.837	84.730	0.000	48
APP	14.898	15.400	17.910	10.056	2.043	-0.580	2.666	2.914	0.233	48
ITP	15.719	15.642	17.753	12.630	1.528	-0.435	2.161	2.923	0.232	48
ACP	14.504	15.176	17.481	10.011	2.275	-0.509	1.867	4.639	0.098	48

Source: *Author's Computation (2021) using E- view 11.0*

The skewness for all the series is low, suggesting that the data sets actually lie very close to the reported mean values, irrespective of the companies. The J-B values for most of the variables series are significant at the 5 percent level indicating that all the series are non-uniformly distributed. This indicates that the assumption of normality in the data cannot be accepted: the series for these variables are non-normally distributed. Clearly, individual firm characteristics within each of the companies play essential roles in the determination of firm performance. The implication of this is that the series across sectors are heterogenous and would actually require a panel data estimation technique.

Further to the descriptive statistics, the correlations among the variables are also conducted in order to observe the pattern of initial interactions amongst the variables in the study. The correlation table is reported in table 4.2 below.

Table 4.2: Correlation Matrix

	ROI	ACP	APP	ITP
ROI	1			
	(0.000)			
ACP	0.013	1		
	(0.341)	(0.000)		
APP	0.334	0.632	1	
	(0.000)	(0.000)	(0.000)	
ITP	0.003	0.855	0.566	1
	(0.297)	(0.223)	(0.108)	(0.000)

Source: *Author's computation (2021) using E-views 11.0*

In the correlation table, it can be seen that all the independent variables have positive correlation with the dependent variable, indicating that they move in same directions. In particular also, the correlations between *ACP* and *ITP* with *ROI* are significant at the 1 percent level. The result shows that there is no correlation amongst the independent variable aside from the earlier positive correlation between the variables. The correlation test also shows that bigger firms are less likely to have huge *ACP*, *APP* or *ITP*, but they are more likely to have larger days of inventory turnover.

We conduct our econometric analysis to predict how companies' working capital affects their performance within the panel data analysis framework. The dependent variable is the return on investment (ROI). Our interest is the extent of responses of ROI to each of the selected determinants in order to ascertain the main determinant of working capital factors for improving firm performances in Nigeria.

Table 4.3 reports the coefficient estimate of model. The goodness of fit statistics in terms of adjusted R-squared is low at 0.123 (although this is to be expected – see Woodridge, 2004). The F-statistic is however significant at the 5 percent level, suggesting a strong empirical relationship between ROI and all the independent variables combined. For the individual performance, the result shows that APP passed the significance test at the 1 percent level (since t-probability for its coefficient is less than 0.01). This implies that only this variable has significant impact on ROI. However, given that data type used in the study, the estimates from OLS appear relatively reliable, hence further tests are carried out to determine the best method of estimation.

Table 4.3: OLS Result for the Sectoral Estimates

Variable	Coefficient	t-Statistic	Prob.
Constant	-0.137	-0.618	0.539
ACP	-0.016	-0.936	0.354
APP	0.037**	3.091	0.003
ITP	-0.007	-0.311	0.757
Adj. R-sq	0.123		
F-stat	3.191 (0.03)		
D-W Stat	2.02		

*Note: * indicate significance at 1% respectively.*
Source: *Author's computation (2021) using E-views 11.0*

As stated in the previous section, the standard test for the method of panel analysis to adopt is the Hausman test for random effects. The result of the test is reported in table 4.4 below. The Chi-Square statistic for the random sections argument is significantly different from zero, implying that the null hypothesis stands rejected. This implies that a random effect does not exist in the cross sections of the data.

Table 4.4: Hausman Test for Cross-Section Random Effects

Test Summary		*Chi-Sq. Statistic*	*Chi-Sq. d.f.*	*Prob.*
Period random		**3.902**	**3**	**0.272**
Variable	*Fixed*	*Random*	*Var(Diff.)*	*Prob.*
APP	0.032	0.035	0.000	0.205
ACP	-0.016	-0.016	0.000	0.943
ITP	0.000	-0.004	0.000	0.352

Source: *Author's computation (2021) using E-views 10.0*

The coefficients of the variables reveal important outcomes. The coefficient of ACP and ITP are negative, which show that the longer the number of days taken to receive debts from debtors or the turnover period, the lower will be the firm performance. Thus, taking too long to receive debts or turnover inventories tends to limit the performance of the firm. On other hand, the coefficient of ACP passed the significance test but is positive, which shows that average pay back period positively affects firm performance.

The longer the days taken to pay back creditors, the better it is for boosting performance. This outcome is rather interesting in the findings. These results clearly indicate that working capital management matter significantly for the performance of firms in Nigeria. The finding of the study shows that some working capital management components is significant to the financial performance of the selected Nigerian manufacturing. The finding is in tandem with the study of Hiram and Willy

(2017) and Okoye, Modebe, Achugamonu and Ado (2016).

Conclusion and Recommendation

Most Nigerian firms have large accounts of cash invested in working capital. It is therefore expected that the way in which working capital is managed, have a significant impact on the performance of those firms. On the basis of the above analysis, we further conclude that these results can be further strengthened if the firms manage their working capital in a more effect, efficient and economical manner. The study therefore recommends that the firms should ensure optimal mix of working capital proxies to optimize performance.

Based on the empirical literatures reviewed, no studies had solely considered working capital management and financial performance of selected Nigerian Manufacturing firms. Also, a similar study should be carried out comparing different sectors on the Nigerian Stock Exchange, to examine the effect of working capital management on financial performance, using other performance proxies.

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