Working Capital Management and the Performance of Selected Quoted Manufacturing Companies in Nigeria (2000-2009)

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Abstract

This study examined the working capital management and the performance of selected quoted manufacturing companies in Nigeria. The study specifically analyzed the effects of working capital management on the performance of manufacturing firms between the periods 2000 – 2009.

The study used secondary data sources which were collected from the Annual Report and Accounts of sixty purposively selected non-financial quoted companies in the Nigerian Stock Exchange Fact book. Data collected were analyzed using descriptive statistics such as mean, median, mode, standard deviation and inferential statistics such as correlation and regression analysis..

The results showed that the average collection period, the average payment period, were positively and significantly related to profitability; inventory turnover in days, cash conversion cycle were also significant but negatively related to profitability; the net trading cycle was negatively related to profitability but not significant. These implied that a reduction in the cash conversion cycle, inventory turnover in days and net trading cycle will generate more profits, while increase in average collection period, average payment period, will generate more profits and additional value for shareholders. The study concluded that efficient management of working capital affects the performance of manufacturing firms in Nigeria.

Keywords: Working capital management, descriptive statistics, inferential statistics, free cash flow, Manufacturing Sector.

1. Introduction

Fund sourcing and management is a challenge to finance managers and finance as a discipline is concerned with the acquisition and disbursement of funds. Finance deals with all those activities involved in ensuring that individuals or organizations have the fund with which to pay his or its bills promptly. The level of sophistication of the business financial management is a function of so many factors ranging from the nature of the enterprise, (service or goods delivery), size of the enterprise, the size of start-up capital, size of working capital, and the potential ability to raising fund/money in the event of future expansion, Mateut and Mizen (2002).

The Nigerian firms exist and have been operating within the financial system that has continued to grow and expand amidst problems; the system is structured among others to enhance greater mobilization of savings and its effective and efficient channeling to the productive sectors of the economy, Kurfi (2003). Manufacturing companies in Nigeria constitute a major component of the real sector of the economy and are strategically positioned to produce goods that bring about growth and development to the economy. Among others, they are to provide employment for the teaming work-force in the economy which is expected to increase the standard of living. To perform these functions, manufacturing companies require huge amount of start-up capital, Ojenike (2012).

The financial institutions both conventional and specialized and more specifically the stock market are expected to provide the much needed capital with ease and at affordable costs. Unfortunately, the financial market failure occasioned by the global financial crisis exacerbated the dearth of credits to the productive manufacturing sector. Today's business organizations, especially the manufacturing industry in Nigeria are operating in a complex and competitive environment characterized by changing conditions and highly unpredictable economic climate. They are particularly operating in unstable economic and tight financial conditions occasioned by perennial changes in monetary and fiscal policies from the home front and global economic meltdown arising from falling world prices of commodities and high exchange rates of world currencies, Ojenike (2012).

The major complaint from all sectors of the Nigerian economy for nonperformance and poor productivity is inadequate funding Oni (2011). The manufacturing sector played a tremendous role in stabilizing the engine of economic growth in terms of employment, export and sources of foreign exchange earnings. Available statistics show that in the 1970s and 80s, the sector contributed between 11 percent and 9.9 percent respectively to the Nations GDP. However, same cannot be said of the current economic situation in the country. Reports indicate that the contribution of the manufacturing sector to the nations GDP continues to dip yearly. Figures released by

the Manufacturers Association of Nigeria (MAN) shows that the manufacturing sector contributes only six percent to the Nations' 2010 GDP; worse still, industrial capacity utilization also dropped to about 28 percent. During the first quarter of 2010, manufacturing activities decreased relatively to the same period in 2009. It recorded a decline in growth rate from 7.03 percent in 2009 to 6.43 percent in 2010. This development was traceable to the low manufacturing activities recorded in the first quarter after the festivities of the last quarter of the previous year, poor electric power supply and inability to access credit from banks arising from the credit crisis in the banking sector, Okereke (2010). Currently many local industries in Nigeria are operating under harsh conditions such as poor energy supply, poor infrastructural facilities, lack of access to fund and high interest rates on bank loans among other business killer factors which continued to retard the growth of the sector, Oni (2011). In the face of companies experiencing tight financial constraints from conventional and specialized financial institutions, companies have devised alternative ways and means of accessing finance to either shore up their working capital, acquiring inventory and/or expanding their productive capacity to meet delivery targets. For most firms in this category, working capital management is an essential element of their finance sourcing strategies.

The objective of this study is focused on analyzing the effect of working capital management on the performance of manufacturing firms that are listed on the Nigerian Stock Exchange for the period 2000-2009.

2. Literature Review
2.1 Empirical evidences.

Shin and Soenen (1998) analyzed a sample of United States firms using Net Operating Cycle as comprehensive measure of working capital management. They found a significant negative relationship between Net Trading Cycle and Profitability. However, this relationship was not found to be very significant when the analysis was for specific industry. Shin and Soenen (1998) also illustrated the importance of good liquidity management with two companies with similar capital structure in 1994, one had a cash conversion cycle of sixty one days while the other has a cash conversion cycle of forty days. As a consequence of this difference, the former faced additional financial costs in the order of $200million per year. This situation was not sustainable because poor working capital management eventually contributed to its bankruptcy. This study illustrates how working capital management which is a key variable for an efficient management of liquidity could lead a firm to bankruptcy when poorly handled and concluded that reducing the level of current assets to a reasonable extent increases a firm's profitability.

Deloof (2003) analyzed a sample of 1009 large Belgium non-financial firms for the period 1992-1996 and the results confirmed that Belgium firms can improve their profitability by reducing the number of days accounts receivable are outstanding and reducing inventories.

Lazaridis and Tryfonidis (2006) investigated the relationship that is statistically significant between corporate profitability the cash conversion cycle and its components. They used a sample of 131 companies listed in the Athens Stock Exchange for the period 2001-2004. The independent variables used were fixed financial assets, the national logarithm of sales, financial debt ratio, cash conversion cycle and its components day's inventory, day's receivable and day's payable. The dependent variable is profitability measured by gross operating profit. The research findings show negative relationship between cash conversion cycle financial debt and profitability, while fixed financial assets have a positive coefficient. When the authors replaced cash conversion cycle with accounts receivable and inventory, they found negative relationship with these two variables, the opposite occurred with accounts payable. The authors concluded that companies can create more profit by handing correctly the cash conversion cycle and keeping each different component to an optimum level.

Rabih Moussawi et al (2006) examined the suggestion that firms over-invest in working capital. If correct, and if recognized by the markets then one should observe a negative relation between investment in working capital and firm value. The study addressed this issue by examining data on samples of United States corporations from 1990 through 2004. The study found out that on the average, firms have over-invested in their working capital in the sense that additional investment in working capital is associated with a reduction in firm value.

Raheman (2006) investigated the impact of working capital management on the profitability of 94 Pakistani firms listed on Islamabad stock exchange for the period 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 profitability of firms. He concluded that there is a strong negative relationship between working capital ratios mentioned above and profitability of firms. Furthermore managers can create a positive value for the shareholders by reducing the cash conversion cycle up to an optimal level.

Raheman and Nazir (2007) selected a sample of 94 listed Pakistan companies from different sectors of the Economy for a period of 8 years, from 1999-2004. The independent variables used were current ratio, day's receivable, day's inventory, days payable and cash conversion cycle. The dependent variable net operating profitability is defined as operating income plus depreciation divided by total assets minus financial assets. In

addition, debt ratio, size of the company and financial assets to total assets ratio were used as control variables. The results show that there is a strong negative relationship between variables of working capital and profitability. For the authors, the negative relationship of accounts payable is consistent with the view that less profitable companies wait longer to pay their bills. There is a negative relationship between liquidity and profitability; yet the current ratio is the most important liquidity measure that affects profitability. They also found positive relationship between size and its profitability. The authors finally found that when debt financing increases, profitability goes down.

Falope and Ajilore (2009) empirically analyzed the working capital management and corporate profitability by using panel data econometrics in pooled regression where time series and cross-sectional observations were combined and estimated. The study which covered the period 1996-2005 found a significant negative relationship between Net Operating Profitability and the Average Collection Period, Inventory Turnover in days, Average Payment Period and Cash Conversion Cycle for a sample of 50 Nigerian firms listed on the Nigerian Stock Exchange. These results suggest that managers can create value for their shareholders if the firms manage their working capital in more efficient ways by reducing the number of days accounts receivable and inventories to a reasonable minimum. This study conformed with Deloof, (2003), Eljelly, (2004), and others who found a strong negative relationship between the measures of working capital management including the average collection period, inventory turnover in days, average payment period and cash conversion cycle with corporate profitability. This study covered the period 1996-2005. Since then, some policies that can affect positively or negatively the working capital management practices of various companies in Nigeria had been put in place.

Akinlo (2010) Conducted a study on the dynamics of working capital and profitability of selected Quoted Companies in Nigeria between 1999 to 2007. The study employed secondary data which consist of selected variables found on the balance sheet as well as the profit and loss account of the purposively selected firms. Macroeconomic variables were sourced from the World Bank Financial Indicator and CBN's Statistical Bulletin. Panel data in pooled regression involving pooled ordinary least square Fixed Effect approach and Generalized Method of (GMM) were used.. The study concluded among others that (i) a long run relationship exists between working capital and profitability with a unidirection of causality running from working capital to profitability (ii) a negative relationship between measures of working capital and profitability i.e. profitability declines with number of days account receivables and inventories, number of days account payable and the cash conversion cycle. This implies that managers can create a positive value for the shareholders by reducing the cash conversion cycle to an optimal level.

Dong and Jyh-tay-Su (2010) studied the relationship between working capital management and profitability in Vietnam stock market for the period 2006-2008 with an attempt to investigate the relationship existing between profitability, the cash conversion cycle and its components for listed firms in Vietnam Stock market. Findings showed that there is a strong negative relationship between profitability, measured through gross operating profit, and the cash conversion cycle. This means that as the cash conversion cycle increases, it will lead to declining of profitability of firm. Therefore the manager can create a positive value for the shareholders by handling the adequate cash conversion cycle and keeping each different component to an optimum level. This paper support Deloof (2003), Raheman and Nazir (2007) who found a strong negative relationship between the measures of working capital management including the number of days accounts receivable, number of days inventories and cash conversion cycle with corporate profitability.. This result also claimed that managers can increase profitability by reducing the number of day's accounts receivable and inventories. Again, the study shows that more profitable firms wait longer to pay their bills.

3. Methodology.

As at 2011 when data were collected for this study, 237 firms are quoted on the Nigerian Stock Exchange. Out of this number, a stratified sample of 60 manufacturing firms cutting across twelve sectors of the Nigerian economy including food and beverages, printing and publishing, chemical and paints, industrial and domestic products,breweries,building materials, health care, agriculture/agro allied, textile, footwear, conglomerate and automobile were selected. The study excluded the financial sectors because of the peculiarity in their holding policies which are substantially different from that of the non-financially quoted companies. Secondary data were employed and collected from the annual reports of the selected firms. Macroeconomic variables were sourced from the World Bank financial indicator and Central Bank of Nigeria's 2010 statistical builletin. The panel data methodology was adopted because it has certain benefits like using the assumption that firms are heterogeneous, more variability, less co linearity between variables, more informative data, more degree of freedom and more efficiency (Baltagi, 2001).

3.1 Model Specifications

To find out the relationship between different variables, correlation coefficients are calculated. The effect of working management on firms' performance is investigated using panel data of purposively selected manufacturing firms listed on the Nigerian Stock Exchange.

For this purpose we adapt an empirical framework first used by Deloof (2003) and subsequent work of Padachi (2006) and specify our model as:

$Y_{it} = \beta x_{it} + \eta_i + \varepsilon_{it}$ …….. (i)

Where i = 1 …….… N

t=1 …….… T

Our equation as

$NOP_{it} = \beta_0 + \beta_1 (WCM_{it}) + \beta_2 (GWCTR_{it}) + \beta_3 (CATAR_{it}) + \beta_4 (CLTAR_{it}) + \beta_5 (FDR_{it}) + \beta_6 (LOS_{it}) + \beta_7 (SG_{it}) + \beta_8 (CR_{it}) + \eta_i + \lambda_t + \varepsilon_{it}$ eqn……..(ii)

Where:

Net Operating Profitability (NOP) is used as a measure of firm's performance.

WCM is working capital management, which is a key variable of the study used as a vector of average collection period (ACP), inventory turnover in days (ITID), average payment period (APP), cash conversion cycle (CCC) and net trading cycle (NTC) of the firm. It is expected that WCM has negative relationship with the corporate profitability. If we reduce number of days in receivable (ACP), Inventory (ITID), cash conversion cycle (CCC) and net trade cycle (NTC), it will enhance the corporate profitability. Further, average payment period is directly associated with profitability. Other explanatory variables typically assumed to affect firm performance are GWCTR is gross working capital turnover ratio which is expected to have positive relationship with profitability, CATAR i.e. current assets to total assets ratio and CLTAR i.e. current liabilities to total assets ratio are used to check the investing and financing policy of working capital management respectively. Financial debt ratio (FDR) representing leverage is expected to have negative relationship and natural logarithm of sales (LOS) representing size has positive relationship with corporate profitability. SG is sales growth which represents the investment growth opportunities while CR is current ratio measures the liquidity of a firm. η_i measures the specific characteristics of each firm and known as the unobservable heterogeneity, whereas λ_t is a parameter for time dummy variable which is equal for all firms in each year but changes over time, and ε_{it} is the error term.

The formula and abbreviations used for measurement of all the variables are presented below

MEASUREMENT OF VARIABLES AND ABBREVIATIONS

Variables	Measurement	Abbreviation
Net Operating Profitability	Earnings before Interest and Tax + Depreciation/Total Assets	NOP
Average Collection Period	Accounts Receivable/ Net Sales	ACP
Inventory Turnover in Days	Inventory/Cost of Goods Sold	ITID
Average Payment Period	Accounts Payable/Purchases	APP
Cash Conversion Cycle	ACP + ITID – APP	CCC
NET Trading Cycle	ACP + (Inventory/Net Sales) – (Accounts Payable/Purchases)	NTC
Gross Working Capital Turnover Ratio	Net Sales/Current Assets	GWCTR
Current Assets to Total Assets Ratio	Current Assets to Total Assets	CATAR
Current Liabilities to Total Assets Ratio	Current Liabilities/Total Assets	CLTAR
Financial Debt Ratio (Leverage)	Total Financial Debt/Total Assets	FDR
Sizes of Farm Using Log of Sales	Natural Logarithm of Sales	LOS
Sales Growth	(Current Year N. Sales – Last Year N. Sales)/Last Year's N. sales	SG
Current Ratio	Current Assets/Current Liabilities	CR

3.2 Data Analysis Techniques

In order to achieve the stated objective, two analytical techniques are employed. These include the descriptive statistics and the inferential statistics. The descriptive statistics involving the use of mean, median, and standard deviation were employed.

While estimating the models, we determined whether there exists a correlation between the independent variables. If the correlation exists then a fixed effect model will give consistent results otherwise random effect will be an efficient estimator and it is estimated by generalized least square (Teruel and Solano, 2007). We have used Hausman (1978) test to determine whether fixed or random effect should be used. The null hypothesis i.e. E $(\eta_i / X_{it}) = 0$ was rejected; therefore fixed effect estimation was used.

To analyze the effects of working capital management on performance of manufacturing firms, we employed correlation matrix to measure the degree of association between profitability and working capital requirement in addition to other variables of interest. Effects of working capital management on corporate performance were also estimated using panel data analysis.

4 Results
4.1 Empirical analysis on the effect of working capital on performance
4.1.1 Descriptive statistics of data series
The descriptive statistics of data series provides information about sample statistics such as mean, median, minimum value, maximum value and distribution of the sample measured by the Skewness, Kurtosis and the Jaque–Bera statistic. These statistics of different variables in the model for the effect of working capital management on performance during the period 2000-2009 are presented in Table i. Sampled manufacturing firms on the average have 158days of cash conversion cycle and 21days net trading cycle with standard deviation of 588 and 29days respectively. The firms have an average collection period of about 33days, inventory turnover in days of 102 and average payment period of 126days. All the series display a high level of consistency as their mean and median values are perpetually within the maximum and minimum values of these series. The relatively low standard deviations for most of the series indicate that the deviations of actual data from their mean value are very small. The Skewness and Kurtosis statistics provide useful information about the symmetry of the probability distribution of various data series as well as the thickness of the tails of these distributions respectively. These two statistics are particularly of great importance since they are used in the computation of Jaque-Bera Statistic, which is used in testing for the normality or asymptotic property of a particular series. The statistics in the table clearly show that the series are positively skewed meaning that the distributions have long right tail. In terms of the peakness or flatness of the distribution of the series measured by Kurtosis, the data showed that the series are peaked relative to the normal. This is because the Kurtosis exceeds 3. The probability that the Jarque-Bera Statistics exceeds (in absolute value) the observed value is generally low for all the series.

4.1.2 Correlation analysis
If effective working capital management increases profitability and hence performance, one should expect a negative relationship between the measures of working capital management and profitability variables. To examine the possible degree of association among the variables, we obtained the correlation matrix of the dependent and independent variables included in the analysis as presented in Table ii which is calculated based on data of 60 manufacturing firms over the study period of 2000 to 2009.

The table shows that working capital (WC) is positively related to the net operating profitability (NOP) suggesting that increase in working capital level will increase the level of profit. The net operating profitability (NOP) is negatively associated with measures of working capital management. [Average Collection Period (ACP), Inventory Turnover in Days (ITID), Average Payment Period (APP), Cash Conversion Cycle (CCC), and Net Trading Cycle (NTC)]. These results are consistent with the view that making payments to suppliers, collecting payments from customers earlier and keeping products or inventories in stock for lesser time are associated with increase in profitability. A negative relationship between average payment period (APP) and net operating profitability (NOP) further suggests that the sampled firms wait longer to pay their account payable. Delaying payments to suppliers allows a firm to assess the quantity and quality of the products bought and can be an inexpensive and flexible source of financing for a firm. The negative correlation between average collection period and net operating profitability implies that longer collection payment period decreases profitability. Granting trade credits favours the firms' sales in various ways. Trade credit can act as an effective price cut. It is an incentive for customers to acquire merchandise at times of low demand. It allows customers to check that the merchandise they receive is as agreed (quantity and quality) and to ensure that the services contracted are carried out (Smith, 1980). However, firms that invest heavily in inventory and trade credit can suffer reduced profitability. In addition, larger inventory reduces the risk of a stock out.

A negative relationship between the cash conversion cycle and net operating profitability implies that if the firms are able to reduce their cash conversion cycle, they can increase their profitability. This negative relationship might not be a surprise because all three components of cash conversion cycle has negative association with the profitability and average payment period is subtracted from the sum of average collection period and inventory turnover in days to form the cash conversion cycle. Similar result was found by the study conducted by Deloof (2003) for Belgian firms. Another measure of working capital management is the net trading cycle which also has a negative relationship with profitability. This implies that if the firms are able to reduce the net operating cycle period, it can enhance the profitability and will ultimately create value for shareholders.

The correlation between financial debt ratio (FDR measured as the ratio of total financial debt to total assets) and net operating profitability is negative. This implies that increase in debt utilization by a firm will reduce profitability. This result is consistent with the pecking order theory and in support of most studies that found a negative relationship between profitability and debt financing. However ,leverage (LEV) on our correlation matrix shows a positive relationship with net operating profitability, which implies that the more debt is, the more profitability and firms value is created. This lends support to the work of Modigliani and Miller, 1963 that took taxation under consideration and proposed that the firms should employ as much debt as possible. Companies have an advantage in using debt rather than using internal capital as they can benefit from debt tax shields. This tax shield allows firms to pay lower tax than they should when using debt capital instead of using

only their own capital. The current liabilities to total assets ratio (CLTAR) on our correlation matrix shows a positive relationship with the net operating profitability and further lend support to the works of Modigliani and Miller. Size measured in terms of natural logarithm of sales has a positive relationship with profitability. This implies that size is associated with increase in the performance of the firms. Size plays an important role in capital structure. Small firms are often managed by very few managers whose main objective is to minimize the intrusion in their business and that is why internal funds will lie in the first place of their preference of finance. If internal funds are not enough, firms will prefer debt to new equity mainly because debt means lower level of intrusion and lower risk of losing control. Firms try to meet their finance needs with a pecking order of personal and retained earnings, debt and issuance of new equity. The positive relationship between firm size and profits possibly indicates the fact that as firm increases in size, they enjoy economies of scale that positively impacted their profit level. A negative relationship between the cash conversion cycle and firm size (LOS) means that the larger the size, the shorter the cash conversion cycle or the smaller the firm size, the longer the cash conversion cycle. This seems to suggest that the firms should look for ways to shorten their cash conversion cycle by shortening inventory turnover period (ITID) and average collection period (ACP). A negative relationship between current ratio and net operating profitability is not contradictory to the traditional belief.

Many arguments support the influence of sales growth on profitability. Whereas old lines of business may be continued if they simply cover their marginal cost or if closing down costs more than continuing, profit seeking managers only initiate business ventures that promise sufficiently high returns. Thus increases in sales from new business should improve profits. Sales growth generally utilizes capacity more fully, which spreads fixed costs over more revenue resulting in higher profitability. Depending on the industry structure, sales growth may also provide additional market power which firms can use to increase performance. Sales growth plays a central role in agency theory. Thomas B. Bush et al, (2000) in the free cash flow hypothesis for sales growth and firm performance investigated the effect of agency factors and corporate governance on the relations between sales growth and performance. They investigated whether firms with free cash flow (FCF) undistributed cash flow in excess of that needed for positive net present value (NPV) project) and weak governance tend to squander the firms money by investing it in unprofitable sales growth. They concluded that for firms with weak governance and high levels of free cash flow, sales growth has a negative influence on performance as free cash flow (FCF) negatively moderates the positive influence of sales growth on performance. Our results agree with this finding.

Agency theorists argued that sales growth does not always lead to increased returns to stockholders. The leveraged buyout literature makes these arguments most strongly and they depend on three premises (Jensen 1986). First, managers try to maximize their own wealth rather than shareholders wealth. This follows the standard economic assumption that individuals attempt to maximize their utility. Second, firms' sales growth contributes to managers' wealth. As Jensen (1986) argued "Managers have incentives to cause their firms to grow beyond the optimal size. Growth increases managers' power by increasing resources under their control. It is also associated with increases in manager's compensation, because changes in compensation are positively related to the growth in sales. Thirdly, two corporate conditions determine whether managers can pursue sales growth at the expense of stockholders wealth: the presence of free cash flow and weak governance. According to the free cash flow hypothesis (Jensen 1993),internally generated cash in excess of positive NPV projects (termed Free Cash Flow) allows managers to pursue personal goals without having to go to the bond or equity market.

Weak corporate governance, the second condition identified by agency theory, refers to a lack of mechanism to align management decisions with shareholders' interests. For example, if management dominates a board of directors, the board will represent managerial interests rather than those of shareholders. Given weak governance, managers pursue sales growth opportunities for their own sake, even if these opportunities offer low returns (Jensen 1993).

4.1.3 Panel data estimates on effect of working capital management on profitability:

The results for different measures of working capital management and selected firms performance including average collection period, inventory turnover in days, average payment period, cash conversion cycle, net operating cycle and other explanatory variables for the selected manufacturing firm as per our equation (ii) are presented on table iii. In our equation working capital management (WCM) is used as a vector of average collection period (ACP), inventory turnover in days (ITID), average payments period (APP), cash conversion cycle (CCC), and net trading cycle (NTC). The coefficient of the average payment period is positive and significantly related to profitability. This implies that as average payment period increases, profitability also increases. This suggests that the sampled firms delayed payments in order to have higher level of working capital reserve which could increase their profit. On the same table, average collection period is positive and significantly related to net operating profitability. This also implies that increasing the average collection period increases profitability in the sampled firms and meant that lengthening of the deadline for clients to make payments provides incentives for increased sales and hence profitability. Inventory turnover in days is negative and significantly related to net operating profitability. This indicates that profitability can be improved by reducing the inventory turnover in days or by keeping inventories for lesser time. The negative and significant

relationship between the cash conversion cycle and net operating profitability implies that the sampled firms can create value for their shareholders by reducing the cash conversion cycle. Net trading cycle is negatively and significantly related to profitability. This implies that a reduction in the net trading cycle will improve net operating profitability. We have analyzed each of these variables with the other control variables in the following section as depicted on tables iv, v, vi, vii and viii

4.1.4 ACP Model Estimation. Model (i)

Table iv presents the estimation of the results of working capital management on corporate performance with average collection period (ACP) as a measure of working capital management. The estimation result indicates that the coefficient of average collection period is positive and significant. This indicates that firms' profitability increases with an increase in average collection period. This looks strange as one would expect a negative relationship which will indicate that firms' profitability performance is reduced by lengthening of the number of days it takes debtors to settle their accounts- in conformity with the studies of Teruel and Solano (2007), Deloof (2003), Falope and Ajilore (2009). We argue that our result conforms to the conventional conjecture that lengthening of deadline for clients to make payments (all other things remaining constant), provides incentives for increased sales and hence profitability. However, a more restrictive credit policy potentially improves firms' profitability performance. We believe that longer period of collection of accounts receivables or longer credit period offered by the company results into higher sales and more sales bring more profit in the business. On the other hand, large time span between the sale and receipt of account receivables require higher investment in current account which is considered as an idle resource and have its own opportunity cost. Furthermore, cash generated by the sale is used to pay the operating expenses of the company. So in this situation, if the credit period offered by the company to its customers is larger than the credit period offered by its creditors then there will be a

financial distress which might lead to bankruptcy.

4.1.5 ITID Model Estimation. Model (ii)

Table v shows the estimation results of the effects of working capital management on corporate performance with inventory turnover in days (ITID) as a measure of working capital management. As expected and in conformity with most existing studies, our estimation result reveals a significant negative relationship between profit and inventory turnover. This can be translated that the longer the inventory is tied in, the less working capital is available, hence lowering of profit. The estimation result indicate that the coefficient of number of days inventories are held is negative and significant, indicating that the sampled firms profitability performance decrease by 18.4% point by a day lengthening of the number of days it takes firm to sell their inventories. The above implies that profitability can improve by reducing the inventory turnover in days or by keeping inventory for lesser time. A positive relationship could also make economic sense in the way that higher inventory is needed to meet the higher demand, buying in bulk also reduce the ordering cost and high trade discount is associated with it. Low inventory level might reduce carrying cost but it will create a trouble in case of sudden rise in demand and if a company will not be able to satisfy the demand, its customers can switch to the competitors brand and this will decrease the level of sales and profitability

4.1.6 APP Model Estimation. Model (iii)

Table vi presents the estimation result of the effect of working capital management on corporate performance with average payment period (APP) as a measure of working capital management. The estimation result indicates that the coefficient of average payment period is positive and significant. This indicates that firm profitability performance is increased by 35% point by a day lengthening of the number of days it takes firms to settle their creditors. Contrary to expectation as well as results from some existing studies, our result shows that there is a positive relationship between profit performance and average payments period. This result is significant and makes economic sense, since the longer a firm delays its payments the higher level of working capital it reserves and uses in order to increase profitability. Thus the more profitable firms wait longer time to pay their bills. Delaying payment to suppliers allow a firm to assess the quality of the products bought and can be an inexpensive and flexible source of finance for the firm. Incidentally, all the other control variables in this estimated form turned out to be insignificant except the financial debt ratio (FDR) and the current ratio (CR). The behaviours of these ratios are consistent with the pecking order theory. This behaviour further confirms that increase in debt utilization by a firm can reduce profitability.

4.1.7 CCC Model Estimation. Model (iv)

Table vii presents the estimation result of the effects of working capital management on performance with cash conversion cycle (CCC) as a measure of working capital management. This model provides a strong evidence of negative and significant relationship between cash conversion cycle and corporate profitability. This result is consistent with the view that decreasing the cash conversion cycle will generate more profits for the firm. It also implies that firms can create value for their shareholders by keeping the cash conversion cycle to minimum. By its definition as the time for which raw materials is kept for processing plus the time for which finished goods are kept and sold and the time taken by the debtors to pay their liability, minus the maturity period of account

payable, it is quite clear that longer cash conversion requires more investment in current assets. Furthermore, good cash conversion cycle is helpful for the organization to pay its obligations at a right time which will enhance the goodwill of the company. On the other hand, a company with poor cash conversion cycle will not be able to meet its current financial obligations and will face financial distress. Cash conversion cycle is also used as a gauge to measure the aggressiveness of working capital policy. It is believed that longer cash conversion cycle corresponds to defensive working capital policy and shorter cash conversion cycle corresponds to aggressive working capital policy (Arnold 2008).

4.1.8 NTC Model Estimation. Model (v)

Table viii presents the estimation result of the effects of working capital management on performance with the net trading cycle (NTC) as a measure of working capital management. The result provides an evidence of negative relationship between net trading cycle and profitability of firms. This implies that firms with relatively shorter net trading cycle are more profitable. Reducing net trading cycle increases the efficiency of working capital management and results in increased operating income. Therefore, by reducing net trading cycle, firms can create additional value for the shareholders.

5. Findings

The results of our descriptive statistics on the empirical analysis of the effect of working capital management and performance showed among other things that cash conversion cycle on the average is 158days, 21days net trading cycle with standard deviations of 588 and 79days respectively. Firms receive payment against sales after an average of about 33days. It takes an average of 102days to sell inventories while the firms wait an average of 126days to pay for purchases.

Our correlation matrix shows that working capital is positively correlated to the net operating profitability suggesting that increased working capital level will increase the level of profit. Net operating profitability is negatively correlated with the measures of working capital i.e. average collection period, inventory turnover in days, average payment period, cash conversion cycle and net trading cycle. This implies that making payments to suppliers, collecting payment from customers earlier and keeping products or inventory in stock for lesser time will increase profit level. Size, measured as the logarithm of sales is positively correlated with net operating profitability - meaning that size is associated with increase in performance i.e. as firms expand, their profit levels equally increases. Our result shows that firm size is negatively correlated with the cash conversion cycle - meaning that the larger the size of the firm, the shorter the cash conversion cycle and suggesting that the firms should explore the ways for reducing their cash conversion cycle by reducing the inventory turnover in days and average collection period.

Contrary to expectation, sales growth is negatively correlated to net operating profitability. One would expect a positive relationship. The existence of weak corporate governance and high levels of free cash flow in the sampled firms to our mind accounted for the negative correlation of sales growth to net operating profitability. According to the Agency theory of corporate governance, managers try to maximize their own wealth rather than the shareholders wealth in line with the standard economic assumption that individuals attempt to maximize their utility. Firm sales growth contributes to manager's wealth as it increases manager's power by increasing the resources under their control. Again, free cash flow and weak corporate governance put manager's interest at odds with the interest of the shareholders.

The result of our correlation further shows that size is associated with increase in the performance of the firms. Size measured in terms of natural logarithm of sales has a positive relationship with the net operating profitability. Firms profitability increases with an increase in average collection period in conformity with the conventional conjecture that lengthening of deadline of clients to make payments all other things being equal provides incentives for increased sales and hence profitability. Inventory turnover in days is negative and significantly related to net operating profitability signifying that the longer inventory is tied in, the less working capital is available and the less the profit. Our sampled firms' profitability performance decrease by 18.4% point by a day lengthening of the number of days it takes to sell their inventories. The sampled firms profitability performance is increased by 35% point by a day lengthening of the number of days it take to settle their creditors. Our result makes some economic sense because the longer a firm delays its payments, the higher level of working capital it reserves and uses in order to increase profitability.

Our model presents a strong evidence of negative and significant relationship between cash conversion cycle and net operating profitability which is consistent with the view that decreasing the cash conversion cycle will generate more profit. Firms with relatively shorter net trading cycles are more profitable. By reducing the net trading cycle, firms can create additional value for the shareholders.

6. Conclusion

Attention should be paid to the efficient management of working capital in the manufacturing sector because such impacts positively on profitability and value to shareholders. Managers can enhance performance by

reducing the number of days in inventories, cash conversion cycle and net trading cycle to a reasonable minimum. This is possible if the components of cash conversion cycle and net trading cycle (ACP, ITID and APP) can be dealt with individually and an optimum effective policy is formulated for these components. Managers can increase the net operating profitability and hence performance by increasing the average collection period, average payment period; reducing the cash conversion cycle, inventory turnover and the net trading cycle. Increasing the gross working capital turnover ratio, the current assets to total assets ratio and size of the firm will increase the net operating profit and hence firms value.

In view of the negative relationship between debt ratio and profitability, firms must endeavor to maintain a reasonably low debt ratio in order to ensure higher level of profitability. The negative correlation between sales growth and net operating profitability is not to the advantage of shareholders. It is an indication of weak corporate governance and calls for the maintenance of a more restrictive credit policy and the need for good corporate governance to be entrenched in the overall operations in the manufacturing firms in Nigeria.

One major limitation of this study is the inability to incorporate all non-financial quoted companies in Nigeria due to absence of reliable and complete data base. Variables like the proportion of outsiders on the board of the selected firms, compensation and Share ownership of the chief executive officers (CEOs), the CEOs unexercised stock options and firms corporate charter provisions measured as governance index all poses further limitations.

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Table 1
Descriptive Statistics

	NOP	CCC	GWCTR	CATAR	CLTAR	FDR	LOS	SGR	CR	APP	ACP	ITID	NTC
Mean	0.876968	1.581453	0.153053	6.371828	6.371828	1.029072	1.581453	0.492888	0.838267	1.266313	0.326673	1.029072	0.21597
Median	0.491615	0.096421	0.103965	2.991502	2.991502	0.068373	0.096421	0.367667	0.652305	1.08874	0.197556	0.068373	0.08078
Maximum	33.10644	95.48665	1.929429	124.4217	124.4217	29.28908	95.48665	10.16538	9.634341	10.99907	5.146725	29.28908	13.21151
Minimum	0.000243	4.67E-06	4.96E-05	4.67E-06	4.67E-06	0.000173	4.67E-06	0.000777	0.089852	0.003712	0.00338	0.000173	6.03E-05
Std. Dev.	2.678484	5.888131	0.221505	12.41498	12.41498	3.535103	5.888131	0.835025	1.101705	1.081884	0.573605	3.535103	0.791284
Skewness	9.793683	9.393674	4.791078	5.2763	5.2763	5.328218	9.393674	9.148225	5.463052	4.192389	5.444834	5.328218	10.82782
Kurtosis	111.1354	126.1628	35.45902	36.66629	36.66629	34.20401	126.1628	97.06427	35.28393	31.36135	36.90927	34.20401	148.4273
Jarque-Bera	296891	381583.6	28157.89	30600.76	30600.76	26728.23	381583.6	225745	28556.78	21502.32	31182.08	26728.23	531443.8
Probability	0	0	0	0	0	0	0	0	0	0	0	0	0
Sum	517.4112	933.0576	90.30103	3759.379	3759.379	607.1523	933.0576	290.8038	494.5776	747.1245	192.7373	607.1523	127.4225
Sum Sq. Dev.	4225.65	20420.68	28.89898	90783.58	90783.58	7360.705	20420.68	410.69	714.9017	689.4083	193.7942	7360.705	368.7904
Observations	590	590	590	590	590	590	590	590	590	590	590	590	590

Source: Authors Computation

ACP	APP		CATAR	CCC	CLTAR	CUR	FDR	GDP	GWCTR	ITID	LEV	LOS	NOP	NTC	PFAF	SGR	WC
1	0.255587	ACP	-0.00711	0.887951	-0.00704	0.016712	-0.00325	-0.09243	-0.15485	0.071132	0.012558	0.002341	-0.0766	0.93523	-0.01137	-0.0708	0.100464
0.255587	1	APP	-0.12172	0.164568	-0.07842	0.011063	-0.08161	-0.05564	-0.20858	0.273579	0.073508	0.172256	-0.1163	0.110759	0.163835	0.033128	0.266965
-0.00711	-0.12172	CATAR	1	0.084385	0.126658	-0.0078	-0.03886	-0.01054	-0.13538	0.059723	-0.02728	-0.33477	0.100802	0.046971	-0.33685	0.206201	-0.24614
0.887951	0.164568	CCC	0.084385	1	-0.02056	0.058255	-0.04625	-0.08228	-0.19451	0.301552	-0.00446	-0.1583	-0.06464	0.909762	-0.17573	-0.09706	-0.02356
-0.00704	-0.07842	CLTAR	0.126658	-0.02056	1	-0.20145	0.097101	-0.02592	0.018357	-0.0575	0.019386	-0.08993	0.02188	-0.01416	-0.09005	-0.14367	-0.05581
0.016712	0.011063	CUR	-0.0078	0.058255	-0.20145	1	-0.10771	0.032723	-0.16645	0.165157	-0.10795	-0.01184	-0.07239	0.02716	-0.00118	-0.00056	0.035863
-0.00325	-0.08161	FDR	-0.03886	-0.04625	0.097101	-0.10771	1	-0.04005	-0.08167	-0.03878	0.203637	0.17261	-0.09768	-0.01571	0.119202	-0.02644	0.000582
-0.09243	-0.05564	GDP	-0.01054	-0.02592	-0.02592	0.032723	-0.04005	1	0.09628	-0.06491	-0.07681	0.064105	0.032324	-0.07855	0.118008	0.086507	0.030497
-0.15485	-0.20858	GWCTR	-0.13538	-0.19451	0.018357	-0.16645	-0.08167	0.09628	1	-0.4042	-0.02613	0.03935	0.133092	-0.09676	0.16054	0.012824	0.003459
0.071132	0.273579	ITID	0.059723	0.301552	-0.0575	0.165157	-0.03878	-0.06491	-0.4042	1	-0.02327	-0.11965	-0.09847	0.058346	-0.14242	-0.14331	0.019199
0.012558	0.073508	LEV	-0.02728	-0.00446	0.019386	-0.10795	0.203637	-0.07681	-0.02613	-0.02327	1	0.068533	0.018022	0.050306	0.066248	-0.05584	0.019528
0.002341	0.172256	LOS	-0.33477	-0.1583	-0.08993	-0.01184	0.17261	0.064105	0.03935	-0.11965	0.068533	1	0.034418	-0.06567	0.320675	0.057041	0.663758
-0.0766	-0.1163	NOP	0.100802	-0.06464	0.02188	-0.07239	-0.09768	0.032324	0.133092	-0.09847	0.018022	0.034418	1	-0.03986	-0.09411	-0.02604	0.034473
0.93523	0.110759	NTC	0.046971	0.909762	-0.01416	0.02716	-0.01571	-0.07855	-0.09676	0.058346	0.050306	-0.06567	-0.03986	1	-0.13317	-0.0505	0.068866
-0.01137	0.163835	PFAF	-0.33685	-0.17573	-0.09005	-0.00118	0.119202	0.118008	0.16054	-0.14242	0.066248	0.320675	-0.09411	-0.13317	1	0.054458	0.248822
-0.0708	0.033128	SGR	0.206201	-0.09706	-0.14367	-0.00056	-0.02644	0.086507	0.012824	-0.14331	-0.05584	0.057041	-0.02604	-0.0505	0.054458	1	0.006314
0.100464	0.266965	WC	-0.24614	-0.02356	-0.05581	0.035863	0.000582	0.030497	0.003459	0.019199	0.019528	0.663758	0.034473	0.068866	0.248822	0.006314	1

Table ii. Correlation Matrix

Table iii

PANEL DATA ESTIMATES OF EFFECTS OF WORKING CAPITAL MANAGEMENT ON NET OPERATING PROFITABILITY

Dependent Variables: NOP, Method: Panel Least Squares, Date: 09/14/12   Time: 11.00, Sample: 2000 2009.
Periods included: 10, Cross-sections included: 59, Total panel (balanced) observations: 590

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.319593	0.171110	1.867764	0.0624
APP	0.447471	0.111651	4.007754	0.0001*
ACP	0.522186	0.217215	2.404006	0.0166*
ITID	-0.172582	0.037144	-4.646354	0.0000*
CCC	-0.027273	0.021398	1.274545	0.0030*
NTC	-0.210119	0.143899	-1.460182	0.1448**

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.581784	Mean dependent var	0.876968
Adjusted R-squared	0.530370	S.D. dependent var	2.678484
S.E of regression	2.439672	Akaike info criterion	4.736982
Sum squared resid	3077.184	Schwarz criterion	5.278930
Log likelihood	-1324.410	Hannan-Quinn criter.	4.948110
F-statistic	2.679926	Durbin-Watson stat	1.806410
Prob (F-statistic)	0.000000		

*Significance at 5%
**Significance at 10%

Table iv Model (i)

ACP MODEL

Dependent Variables: NOP. Method: Panel Least Squares, Date: 09/14/12   Time: 14:16, Sample: 2000 – 2009.
Periods included: 10, Cross-sections included: 59, Total panel (balanced) observations: 590

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.306669	0.177440	1.728291	0.0845
ACP	0.243347	0.306758	2.179320	0.0080*
GWCTR	0.380257	0.598485	0.635367	0.5255
CLTAR	-0.377065	0.136173	2.769015	0.0058*
FDR	-0.184422	0.038137	-4.835753	0.0000*
LOS	0.140797	0.048422	2.907686	0.0038*
SGR	0.105459	0.173037	0.609458	0.5425
CR	0.205112	0.177476	1.155716	0.2483
CATAR	0.134560	0.049097	2.740710	0.0063*

Effects specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.581412	Mean dependent var	0.876968
Adjusted R-squared	0.556559	S.D. dependent var	2.678484
S.E of regression	2.530554	Akaike info criterion	4.733843
Sum squared resid	3036.502	Schwarz criterion	5.298062
Log likelihood	-1320.484	Hannan-Quinn criter.	4.953647
F-statistic	2.683885	Durbin-Watson stat	1.946462
Prob (F-statistic)	0.000000		

*Significant at 5%

Table v Model (ii)
ITID MODEL

Dependent Variables: NOP, Method: Panel Least Squares, Date: 09/18/12   Time: 14:28, Sample: 2000 2009.
Periods included: 10, Cross-sections included: 59,Total panel (balanced) observations: 590

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	- 0.306415	0.177376	1.727487	0.0847
ITID	- 0.184238	0.038123	-4.832760	0.0000*
GWCTR	0.337336	0.595819	0.566172	0.5715
CLTAR	-0.360731	0.134559	2.680842	0.0076*
CATAR	0.134738	0.049079	-2.745342	0.0063*
FDR	-0.174422	0.037137	-4.635763	0.0000*
LOS	0.142297	0.048368	2.941985	0.0034*
SGR	0.124716	0.171264	0.728208	0.4668
CR	0.302997	0.127516	2.376141	0.0179*

Effects specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.580532	Mean dependent var	0.876968
Adjusted R-squared	0.557715	S.D. dependent var	2.678484
S.E of regression	2.429679	Akaike info criterion	4.731677
Sum squared resid	3040.220	Schwarz criterion	5.288472
Log likelihood	-1320.845	Hannan-Quinn criter.	4.948589
F-statistic	2.713603	Durbin-Watson stat	1.948748
Prob (F-statistic)	0.000000		

*Significant at 5%

Table vi
APP MODEL

Dependent Variables: NOP, Method: Panel Least Squares, Date: 09/14/12   Time: 14.32, Sample: 2000 2009,
Periods included: 10, Cross-sections included: 59, Total panel (balanced) observations: 590

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.336588	0.186409	1.805647	0.0716
APP	0.353917	0.135538	2.611200	0.0093*
GWCTR	0.281728	0.600350	0.469273	0.6391
CATAR	0.003685	0.009759	0.377586	0.7059
CLTAR	- 0.002385	0.007759	0.356586	0.0059*
FDR	-0.178861	0.038364	-4.662194	0.0000*
LOS	0.025913	0.022712	1.140948	0.2544
SGR	0.114857	0.172452	0.666021	0.5057
CR	0.292602	0.128396	2.278895	0.0231*

Effect specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.570205	Mean dependent var	0.876968
Adjusted R-squared	0.545341	S.D. dependent var	2.678484
S.E of regression	2.447054	Akaike info criterion	4.745929
Sum squared resid	3083.859	Schwarz criterion	5.302724
Log likelihood	-1325.049	Hannan-Quinn criter.	4.962841
F-statistic	2.576722	Durbin-Watason stat	1.928512
Prob (F-statistic)	0.000000		

*Significant at 5%

Table vii Model (iv)
CCC Model Estimation

Dependent Variables: NOP, Method: Panel Least Squares, Date: 09/14/12   Time: 14.37, Sample: 2000 2009,
Periods included: 10, Cross-sections included: 59, Total panel (balanced) observations: 590

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.579214	0.162508	3.564215	0.0004
CCC	-0.026449	0.022839	2.158085	0.0074*
GWCTR	0.306593	0.603649	0.507899	0.6117
CLTAR	-0.003685	0.009759	-0.376586	0.0066*
CATAR	0.004246	0.009812	0.432774	0.6654
FDR	-0.179065	0.038580	-4.641440	0.0000*
SGR	0.314471	0.155452	2.022952	0.0436*
CR	0.428478	0.118039	3.629964	0.0003*
LOS	0.140708	0.046420	2.841885	0.0038*

Effects specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.570543	Mean dependent var	0.876968	
Adjusted R-squared	0.535929	S.D. dependent var	2.678484	
S.E of regression	2.460812	Akaike info criterion	4.755692	
Sum squared resid	3124.688	Schwarz criterion	5.305063	
Log likelihood	-1328.929	Hannan-Quinn criter.	4.969711	
F-statistic	2 .490534	Durbin-Watson stat	1.952738	
Prob (F-statistic)	0.000000			

*Significance at 5%

Table viii   Model v
NTC Model Estimation

Dependent Variables: NOP, Method: Panel Least Squares, Date: 09/14/12   Time: 14.39,Sample: 2000 2009,
Periods included: 10, Cross-sections included: 59, Total panel (balanced) observations: 590

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.583394	0.162286	3.594850	0.0004
NTC	-0.232953	0.145888	-1.596792	0.1109
GWCTR	0.251775	0.603722	0.417038	0.6768
CATAR	0.004223	0.009797	0.431093	0.6666
CLTAR	-0.003223	0.008690	-0.331092	0.0016*
FDR	-0.169624	0.038973	-4.352365	0.0000*
SGR	0.301473	0.155432	1.939580	0.0530
CR	0.464108	0.119956	3.868989	0.0001*
LOS	0.029244	0.022872	1.278624	0.2016

Effects specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.594186	Mean dependent var	0.876968	
Adjusted R-squared	0.558457	S.D. dependent var	2.678484	
S.E of regression	2.457125	Akaike info criterion	4.754143	
Sum squared resid	3109.294	Schwarz criterion	5.310938	
Log likelihood	-1327.472	Hannan-Quinn crit	4.971055	
F-statistic	2.498713	Durbin-Watson stat.	1.829628	
Prob (F-statistic)	0.000000			

*Significant at 5%

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