

**THE IMPACT OF WORKING CAPITAL MANAGEMENT ON THE PROFITABILITY  
OF LISTED INDUSTRIAL GOODS FIRMS IN NIGERIA**

**BY**

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**A DISSERTATION SUBMITTED TO THE POSTGRADUATE SCHOOL OF AHMADU  
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## **DECLARATION**

I declare that the work in this thesis entitled “Impact of Working Capital Management on The Profitability of Industrial Goods Firms in Nigeria” was carried out by me in the Department of Accounting. The information derived from literature has been duly acknowledged in the text and a list of references provided. No part of this thesis was previously presented for award of another degree or diploma at this or any other institution.

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## CERTIFICATION

This research work titled “Impact of Working Capital Management on The Profitability of list Industrial Goods Firms in Nigeria” Meets the requirements governing the award of Master of Science Degree (MSc) in Accounting and Finance of Ahmadu Bello University, Zaria and is hereby approved for its contribution to knowledge and literary presentation.

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## **DEDICATION**

I dedicate this research work to my parents who by faith sent me to school. This is the substance of the knowledge they hoped I will acquire and the evidence of what they did not see. To God be the Glory.

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I give glory to God Almighty for giving me the rare opportunity to conclude this research work.

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## ABSTRACT

This study examines the impact of working capital management on profitability of quoted industrial goods companies in Nigeria. The study covers the period of eight years (2009 -2016) with the population of twenty one listed industrial goods firms in the Nigeria stock exchange as at 31<sup>st</sup> December 2016. The study adopted Correlation Research Design. The data were analyzed using OLS multiple regression technique. The study findings are that: Account Receivable Day (ARD) has a positive significant impact on the Return on Asset (ROA) of industrial goods firms in Nigeria at 1% significance level, Account payable Days (APD) has a negative insignificant impact on the Return on Assets (ROA) of industrial Goods Firms in Nigeria at 1% level of significance. Inventory Turnover Day (ITO) has a negatively significant impact on the Return on Asset (ROA) of industrial goods firms in Nigeria at 1% level of significance and cash Conversion Circle (CCC) has a positively significant impact on Return on Asset (ROA) of the Industrial Goods Firms in Nigeria at 5% level of significance. The study recommend among others: The management of the listed industrial goods companies in Nigeria should enhance the performance of the companies by maintaining the number of days in inventories to a reasonable level. Management of the listed industrial goods companies in Nigeria should reduce the account receivable days so as to boast the profitability and performance of the companies. Management of the listed industrial goods companies in Nigeria can increase their profitability, thus, by increasing the account payable days also the companies should make judicious utilization of their resources by reducing the cash conversion cycle of the companies to a barest minimum, this shall in turn increase the company profitability.

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# CHAPTER ONE INTRODUCTION

## 1.1 Background to the Study

Working Capital Management refers to a company's managerial accounting strategy designed to monitor and utilize working capital components (current assets and current liabilities) to ensure the most financially efficient operation of the firm (Investopedia. 2018). Working capital management involves planning and controlling current assets and current liabilities in a manner that eliminates the risk of inability to meet short term obligations when due and to avoid excessive investment on current assets which leads to idle cash (Eljelly, 2004). Working capital management involves decisions on the amount which constituted the composition of net current assets and the financing of these assets (Samson, et al, 2012).

Working Capital Management can also be defined as the controlled process of current assets less current liabilities (Lukarris & Eero, 2011). Weston & Bringham (2015), defined working capital management as investment in short term assets. We have observed that most researchers see working capital management through the prism of working capital and they try to define working capital as follows: Cheng, Frank and Wu (2009) and Guthman & Dougall (1948) defined working Capital as receivables plus inventory minus payables. Working Capital are short term balance sheet items which are attributable to current assets on the assets side and current liabilities on the liabilities side of the balance sheet (Brealey, Meyers & Allen, 2011, p.856). The main elements of working capital should include cash, marketable securities, receivables and inventories which are important for the management of the company (Ali & Ali, 2012).

Working Capital Management is important as it has direct impact on the profitability of firms (Ray, 2012). To maintain liquidity and profitability of an organization, its working capital should be managed efficiently (Nazir & Afza, 2009). This entails planning and controlling current assets and current liabilities of firms with the view to reduce the risk of inadequate and non-availability of cash (Adeniji, 2008).

Deloof (2003) posited that working capital management directly affects the liquidity and profitability of firms, the study argues that firms in a given large sample must vary in terms of size, age and Technology among others; that liquidity settings will also vary greatly depending on the risk appetite of the firm. Also, that firms will have different credit ratings that determines the way in which these firms make their purchases. According to Raheman and Nasr (2007) “Excessive level of current assets account can easily result in a firm realizing a substandard return on investment”, hence the need to manage working capital. The working capital management variables considered by this study are; account receivables, inventories turnover, account payable and cash conversion cycle (Lukkaris & Eero, 2011).

Working capital management involves planning and controlling current assets and current liabilities in a manner that eliminates the risk of inability to meet short term obligations when due and to avoid excessive investment on current assets which leads to idle cash (Eljelly, 2004) and looking at the nature of working capital and its components which are short lived, there is the need to manage working capital in order to attain profitability. “Current assets are short-lived investments that are continually being converted into other asset types” (Rao, 1989). When a firm maintain excessive current asset, it ends up tying down firm resources and that can affect

profitability (Rahem & Nasir, 2011). Also, large inventory and a generous trade credit policy may lead to high sales, but that does not translate in to profitability (Rahem & Nasir, 2011).

Efficient working capital management is necessary for achieving both liquidity and profitability of a company (Nazir & Afza, 2009). A poor and inefficient working capital management leads to tying up funds in idle assets and reduces the liquidity and profitability of a company (Reddy & Kameswari, 2004). Working capital management became important and necessary during the financial crisis up to 2008 because the cost of long term debt increases and the new cost levels become difficult to attain, hence the need to manage working capital, especially when it can influence firm profitability and risk (Smith, 2018).

Keeping larger inventory by a firm reduces the likely risk of a stock-out (Rahem & Nasr, 2007), even at that, inventories are not to be kept at an arbitrary level, there is the need for deliberate planning and continuous check on the inventory. Given that Inventories can save the firm from the risk of losing an important customer by meeting up with their unexpected demand; however, keeping too much idle stock may create unnecessary liquidity shock to a firm thereby affecting firm profitability, hence the need for tradeoff between liquidity and profitability which is ultimately working capital management (Shin & Soenen, 1998).

Firms sometimes bought goods on credit from its suppliers meant to be payable in the near future, delaying payment to suppliers allows a firm to assess the quality of products bought, and can be an inexpensive and flexible source of working capital for the firm (Perri, 2008). This in essence allows firms to utilize the available cash that ought to be used for paying for supplies to another profitable investment opportunity. However, late payment of invoices can be very costly

if the firm is offered a discount for early payment (Rahem & Nasr, 2007). This decision process need to be taken by top management and is considered as payables management and as a component of working capital, it can be seen as working capital management (Cannon, 2008).

Cash conversion circle is a fundamental tool applied in the assessment of the efficiency of working capital management (Richard & Laughlin, 1980). The common measure of working capital management (WCM) is the cash conversion cycle (CCC), this is the time between making payment for the raw materials purchased and the receipts of proceeds of sales of finished goods (Deloof, 2003). The more days a company's money is tied up in inventory, the longer the cash conversion cycle and the longer the number of days creditors must wait for their money (Jason & Kasozi, 2017). It is usually recommended that firms should have shorter cash conversion cycle for them to be profitable and remain credit worthy (Bibi & Ajmad, 2017).

A longer CCC may translate into poor profit as inventories are either not converted into goods on time or they are converted, sold and yet the debtors have delayed payment or we have delayed paying our creditors (Billie, 2014). Hence, when CCC is shortened, it is expected to improve firm's profitability. Longer CCC results to a greater need for expensive external financing as cash are tied down on inventories or because we have lost our credit worthiness as such we have to look elsewhere to finance that which ordinarily would have been made available to us by our creditors (Nordmeyer, 2015). Longer CCC ultimately suggest that the firm is less likely to obtain credit when needed and less likely to continue in business as it is cash trapped (Jason & Kasozi, 2017). When there is a reduction in the time cash are tied up in working capital, it tends to improve on the efficient operations of the firm. The CCC is a useful way of assessing the firm's

cash flow as it is the measure of time that the funds were invested in working capital (Pratap, Kumar & Colombage, 2017). CCC is often regarded as the powerful and more comprehensive measure of WCM than using the current ratio and the quick ratio which focus on statistical balance sheet values (Quang, 2017). The CCC includes the time dimension of liquidity which measures the overall ability of firms to manage cash (Pratap, Kumar & Colombage, 2017).

There are two major measurement of firm's performance commonly put to use, these are return on asset (ROA) and return on equity (ROE) (Meena & Reddy, 2016). The impact of working capital management on the financial performance of industrial goods firms is often measured using the return on asset (ROA) and not return on equity (ROE) because of timing and value issues against ROE (Falope & Ajilore, 2010). Often, net operating income and gross operating income are also used as the measure of financial performance. Also, the use of operating income to sales and operating cash flow to sales is beginning to gaining currency as a measure of firm's performance (Enow & Brijlal, 2014). The operating income is often used as a measure of firm's earnings power from ongoing operation and it is regarded as the difference between revenues and operating expenses. However, for the purpose of this work, return on assets (ROA) will be adopted as the proxy of firm profitability because in manufacturing companies, the firm is being financed mostly by the proceeds from the assets of the company (Falope & Ajilore, 2010).

On the basis of the above background, the study attempts to evaluate the impact of working capital management on the profitability of industrial goods firms in Nigeria. What motivate this study is that, working capital management has been regarded as part of the financing

considerations that a finance manager of a corporation needs to determine apart from capital structure and budgeting. Recently, companies have been putting more emphasis on maximizing profitability from their business operation (Akoto, Vitor & Angmor, 2013), hence the need to manage their working capital. Consequently, in determining the firm's profitability, finance managers need to take account of the firm's working capital management which basically means managing the firm's current assets and current liabilities (Park & Gladson, 1963). In a balance sheet, current assets consist of account receivables, cash and bank balances which are short term in nature and are used for production and sales; that can be converted in to cash within the year (Raheman & Nasr, 2007). Similarly, current liabilities refer to obligations that need to be paid within the year or not beyond the business operating cycle, whichever is earlier (Ross, Westerfield & Jaffe, 2010). Hence, current liabilities comprises of accounts payable, accrued wages, taxes, short term debt and other expenses payable (Ali & Ali, 2012).

Managing working capital efficiently, increases firm's profitability and shareholder value (Dong & Su, 2010). In addition, the benefits of having an efficient working capital management is that the firms would be able to meet its short term obligations and maintain adequate liquidity position in order to continue the operation of the firms (Dalayeen, 2017). In line with this, working capital management decision is an important factor as it determines the firm's value maximization and shareholders wealth (Dong & Su, 2010).

## **1.2 Statement of the Problem**

Empirical study on the relationship between Working Capital Management and profitability dwelling on Industrial Goods Firms in Nigeria must be ubiquitous to enable industrialist have information at the snap of their finger. These should be the material that will drive their firms forward by sustaining firms operation so that Nigeria will be positioned in the community of industrialized nations. Nigeria has in its Vision of becoming one of the 20<sup>th</sup> Industrialized Economy in the World by year 2020 and a leading Economy in Africa; Nigerian Industrialist need to know the importance of managing their Working Capital and the relationship that exist thereto with profitability for Nigeria to sustain the tide. Adequate knowledge on Working Capital Management in the Industrial Goods Firms will help in solving the Country's developmental challenges such as unemployment, poverty and other related problems; as its industries will flourish as they become profitable. Many Industries earlier established have either folded or are performing very low due to their improper management of working capital which results in lack of appropriate financing and access to trade credit (Masocha & Dzamonda, 2016, Enow & Brijlal, 2014).

It has been found that there are a lot of research work on working capital management and profitability but there is none that dwell on the Industrial Goods Firms in Nigeria. This has created a gap in the body of knowledge in the Industrial Goods Firms in Nigeria. With this research, material will be made available that dwells on the Industrial Goods Firms in Nigeria. The research shall make materials available which inevitably bridge the gap that exits from the paucity of materials dwelling on Working Capital Management and Profitability in the Industrial



Goods Firms in Nigeria. With this material, there is no need for extrapolation of information that will suffice for knowledge in the Industrial Goods Firms in Nigeria.

This gap in knowledge is to be filled by conducting a study on the Impact of Working Capital Management on the Profitability of Industrial Goods Firms in Nigeria. The Variables to be deployed for the study consist of Account Receivable Days, Inventory Turnover Days, Accounts Payable Days and Cash Conversion Circle as Proxies for the Independent Variable and Return on Assets as Proxy for the Dependent Variable. This work will look at the impact of managing Account receivable days (ARD), Inventory turnover days (ITO), Account payable days (APD) and cash conversion cycle (CCC) on profitability of industrial goods firms in Nigeria. Failure to investigate this relationship will be an issue for concern because there is no specific study that cover the Industrial Goods Firms in Nigeria as far as the Impact of Working Capital Management on Profitability is. This work will serve as material that will cover the knowledge gap that exist as a result of deficit of research materials on the Industrial Goods Firms in Nigeria.

### **1.3 Research Questions**

Based on the problem statement highlighted, the following questions were formulated:

- i. To what extent does Accounts Receivable Days (ARD) affect the Return on Asset (ROA) of Industrial Goods Firms in Nigeria?
- ii. To what extent does Inventories Turnover Days (ITO) affects the Return on Asset (ROA) of Industrial Goods Firms in Nigeria?

- iii. To what extent does Accounts Payable Days (APD) affects the Return on Asset (ROA) of Industrial Goods Firms in Nigeria?
- iv. To what extent does Cash Conversion Circle (CCC) affect the Return on Assets (ROA) of Industrial Goods Firms in Nigeria?

#### **1.4 Objectives of the Study**

The main objective of the study is to examine the effect of working capital management on the profitability of quoted industrial goods firms in Nigeria. The specific objectives are as follows;

- i. To evaluate the impact of Accounts Receivable Days (ARD) on Return on Asset (ROA) of Industrial Goods Firms in Nigeria.
- ii. To investigate the impact of Inventory Turnover Days (ITO) on Return on Asset (ROA) of Industrial Goods Firms in Nigeria.
- iii. To examine the impact of number of days Accounts Payable Days (APD) on Return on Asset (ROA) of Industrial Goods Firms in Nigeria.
- iv. To evaluate the impact of cash conversion cycle (CCC) on return on asset (ROA) of Industrial Goods Firms in Nigeria.

#### **1.5 Hypotheses of the Study**

In line with the objectives of the study, the following hypotheses were formulated in a null form:

H<sub>01</sub>: Accounts Receivable Days (ARD) has no significant impact on the Return on Asset (ROA) of Industrial Goods Firms in Nigeria.

H<sub>02</sub>: Inventory Turnover Days (ITO) has no significant impact on the Return on Asset (ROA) of Industrial Goods Firms in Nigeria.

H0<sub>3</sub>: Accounts Payable Days (APD) has no significant impact on the Return on Asset (ROA) of Industrial Goods Firms in Nigeria.

H0<sub>4</sub>: Cash Conversion Cycle (CCC) has no significant impact on the Return on Asset (ROA) of Industrial Goods Firms in Nigeria.

## **1.6 Scope of the Study**

The research focused on twenty-one (21) Industrial Goods Firms listed on the Nigeria Stock Exchange (NSE) for the period of Eight (8) years (2009-2016). The variables of the study were restricted to: Accounts Receivable Days (ARD), Inventories Turnover Days (ITO), Accounts Payable Days (APD) and Cash Conversion Cycle (CCC). These variables were chosen because they are the basic components of working capital and they are the major constituents of working capital of Industrial Goods Firms.. The choice of the Industrial Goods Firms is as a result of the fact that they are the Firms that heavily use inventories, more so Nigeria has a vision to be one of the Top 20 Industrialised Countries by the year 2020. With respect to Return on Asset as the dependent variable, the variable was chosen because ROA explicitly take into account the assets used to support business activities (Mogaka & Jagongo, 2013, Almazari, 2013, Sharma & Kumar, 2011, Biger & Mathur, 2010 and Teruel & Solano, 2007). Assets of manufacturing companies like Industrial Goods Firms need a higher level of net income to support the business unlike asset of small companies where even small margins can generate a healthy ROA (Hagel, Brown & Davision, 2010). As the industries pick up after the crisis, we need to know the relationship that subsist between ROA and ARD, ITO, APD and CCC in the Nigerian Industrial Goods Firms.

## **1.7 Significance of the Study**

Conducting this study will be of immense importance to firm managers, for it will help expand their learning curve and help reduce the possibility of default, especially in turbulent time. It is believed that the outcome of the study will be of immense benefit to the managers of quoted Industrial Goods Firms in Nigeria by opening new doors for improvement, growth and excellence in their operations. The findings will assist them in taking long lasting decisions on the area of financing working capital.

Also, it will be of benefit to existing and potential investors of quoted Industrial Goods Firms in Nigeria in identifying potential portfolios. It will assist them in assessing the financial performance of the quoted Industrial Goods Firms in Nigeria, as they will be able to view the working capital of these firms from the statement of financial positions of the firms and factor it as to whether they are managed efficiently or not. Development Finance bodies like the Bank of Industry will find this as a handy manual for assessing Industries that approach them for financing. The findings of this research will hopefully contribute to knowledge and add to the literatures on the effects of working capital management on profitability of quoted Industrial Goods Firms in Nigeria. This study will also be valuable for practitioners, policy makers, firm managers and academician with regards to issues associated with Working Capital Management and Profitability of Firms.

The regulatory authorities such as Nigerian Stock Exchange (NSE), Security and Exchange Commission (SEC) will find this study valuable as it will enable them assess the performance of

Industrial Goods Firms by taking relevant decision in respect of the companies, based on the indices and information made available here.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter reviews and presents relevant literatures on working capital management and firm profitability. It discusses the concept of working capital, management of working capital and concept of profitability. The chapter also presents the objectives of working capital management, working capital management policies. Empirical studies on working capital management and theoretical framework are also discussed and presented.

#### **2.2 Concepts of Working Capital Management**

Working capital management refers to the administration of current assets namely; cash, marketable security, receivable and inventory, (Van Horne, 1977). Working capital management is important because of its effects on the firm's profitability, risk and consequently, its value (Smith, 1980). Trade credit is of benefit to firm's sales in the following ways. Trade credit can act as an effective price cut (Petersen & Rajan, 1997 and Brenna, 1988). It is an incentive for customers to acquire merchandise at time of low demand (Emery, 1984). It allows customers to check that the merchandise they receive is as agreed upon in terms of quantity and quality and to ensure that the service contracts are carried out (Smith, 1980). However, firms that invest heavily in inventory and trade credit can suffer reduced profitability. In addition, large inventory may reduce the risk of stock out. Trade credit therefore, may stimulate sales because it allows customers to assess product quality before making payment (Deloof and Jegers, 1996). It can also be an inexpensive source of credit for customers since suppliers may have significant cost

advantage over financial institutions in providing credit to their customers (Petersen and Rajan, 1997). Accounts payable is also a component of working capital (Moles, et al, 2011). Delaying payment to suppliers may allow firms make adequate assessment on the quality of products bought and can be an inexpensive and flexible source of financing the firm (Falope & Ajilore, 2010).

On the other hand, trade credit is a spontaneous source of financing which reduce the amount of financing through the sums that are tied up in inventory (Deloof and Jegers, 1996). However, it should be noted that financing from suppliers can have a rather high implicit cost of discount that are available for early payment (Petersen & Rajan, 1997). In fact, the opportunity cost may exceed 20% depending on the discount percentage and the discount period granted (Wilner, 2000). Since money is also tied up in working capital, the greater the investment in current assets, the lower the risk, but also the lower the profitability obtained (Falope & Ajilore, 2010).

Working capital management is concerned with the problem that arises in attempting to manage current assets, current liabilities and the interrelationship that exist between them. The major current assets are cash, marketable security, account receivable and inventory (Tewodros, 2010, Afiz & Nazir, 2007, Padachi, 2006, Eljelly, 2004 & Deloof, 2003). The basic current liability includes account payable, bills payable, bank overdraft and outstanding expenses (Moles, et al, 2011). The current assets should be adequate to cover the firm's current liabilities so as to ensure reasonable margin of safety (Iqbal, et al, 2017). Each of the components of Working Capital should be managed efficiently in order to maintain liquidity, while avoiding having too high a

level of either of them (Tewodros, 2010). The interaction between current assets and current liabilities is therefore, the main theme of working capital management (Moles, et al, 2011).

### **2.2.1 Concept of Average Receivables**

Provision of trade credit is normally used by businesses as a marketing strategy to expand or maintain sales (Pandey, 2004). Efficient receivables management augmented by a shortened debtors' collection period, low levels of bad debts and a sound credit policy often improves the businesses' ability to attract new customers (Lazaridis & Dimitrios, 2005). Costs of cash discounts and costs of managing credit and credit collections constitute the carrying costs associated with granting a credit which increases when the amount of receivables granted are increased (Hansen & Mowen, 2005). Lost sales resulting from lack of granting credit constitute the opportunity cost which decrease when the amounts of receivables are increased (Lazaridis & Dimitrios, 2005). Michalski (2007) provides that an increase in the level of accounts receivables in a firm increases both the net working capital and the costs of managing accounts receivables, this also can lead to a decrease in the value of the firm. Lazaridis & Dimitrios (2005), argued that firms that pursue increase in their accounts receivables to an optimal level increase their profitability. Juan & Martinez (2002), emphasized that firms can create value by reducing their number of days of accounts receivable, while Deloof (2003) wrote that the length of receivables collection period has a negative effect on a firm's performance. Sushma and Bhupesh (2007) also affirmed that, putting in place a sound credit policy ensures proper debt collection procedures and is pivotal in improving efficiency in receivables management hence the performance of firms.



### **2.2.2 Concept of Inventory**

Inventories are raw materials, work-in-progress and finished goods (Serhii ZIUKOV, 2015). Managers act rationally in managing their inventory efficiently if they are convinced that the practice enhances firm performance. Traditionally, inventories of raw materials, work-in-progress components, and finished goods were kept as a buffer against the possibility of running out of needed items (Serhii ZIUKOV, 2015). Keeping inventories has cost implication that can affect profitability (Fullerton, et al, 2003). Inventory management leading to inventory reduction has become the primary target, as is often the case in just-in-time (JIT) systems, where raw materials and parts are purchased or produced just in time to be used at each stage of the production process. This approach to inventory management brings considerable cost savings from reduced inventory levels. As a result, inventories have been decreasing in many firms (Chen, Frank & Wu, (2005).

According to Chen, et al. (2005), firms with high inventories usually have poor stock returns. On the other hand, firms with abnormally low inventories have ordinary stock returns. Inventory management leads to inventory reduction, as is often the case in JIT. Fullerton et al. (2003) give support that firms that implement higher degrees of JIT manufacturing practices should outperform competitors who do not. Eroglu and Hofer (2011) argue that inventory leanness is the best inventory management tool. Lean production itself considers inventory as a form of waste that should be minimized and it has become synonymous with good inventory management (Eroglu & Hofer, 2011).

### **2.2.3 Concept of Accounts Payable**

Accounts payable is said to be the aggregate amount of an entity's short term obligation to pay suppliers for products or services when the entity purchase on credit (Moodley, et al, 2015). Accounts payable arise from trade credit, which is an important portion of working capital, if managed well, it will work in favour of both the buyer and the supplier. Here, the buyer is able to get short term financing from the seller, while the seller, by offering credit is able to push his products and built a relationship with the buyer. Sellers usually provide discount to encourage early payment from buyers. For example, the term "2/10 Net 30" indicate that the buyer will get a 2% discount if he pay within 10 days of purchase. If the buyer doesn't want to make use of the discount period, then payment should be made within 30 days of purchase.

Just like receivables and Inventories, it is important for a firm to manage payables efficiently. When a firm pay its payables too early, it will be seen to be using its cash unnecessarily thereby wasting the opportunity cost of using it elsewhere. However, delaying too much beyond payment due dates will diminish the firm's credit rating which will lead to harsher or stricter credit terms in the future. The tool used by firms to measure the effectiveness of payables management is the average days of payables outstanding. A short payables days indicates that the company pays faster. This could be that the company is taking advantage of the discounts given for paying early, while late payment is an indicator of poor payables management or the company has liquidity problem.

Several studies has suggested that relationships exist between payables and profitability of firms, hence the need to manage payables. Iqbal (2014) said “there is a positive relationship between payables and profitability of firms”. Van-Nhan (2017) pointed out that less profitable firms wait longer to pay their bills. While Deloof (2003, p.258) said “the negative relationship between accounts payable and profitability is consistent with the view that less profitable entities wait longer to pay their bills”. This indicates that profitability is affected by payables policy and not vice versa. Gill (2010) said the inverse correlation between payables and profitability is contrary to the theory that advocates extending payment terms as a means of managing working capital with the aim of improving liquidity and profitability. With this information at hand, it behooves on us to manage payables effectively to be able to make profit so that our firms will remain in business.

#### **2.2.4 Concept of Cash Conversion Cycle**

The cash conversion cycle, which represents the interaction between the components of working capital and the flow of cash within a company, can be used to determine the amount of cash needed for any sales level (Hutchinson, 2007). Gitman (1974) developed a cash conversion cycle equation which is calculated by adding inventory holding days to accounts receivables days and then subtracting accounts payable days from it and expressed it as follows:  $(CCC=ARD+ITO-APD)$ . Its focus is on the length of time between the acquisition of raw materials and other inputs and the inflows of cash from the sale of finished goods, this represents the number of days of operation for which financing is needed (Botoc & Anton, 2017).

The CCC is a dynamic measure of ongoing liquidity management, since it combines both balance sheet and income statement data to create a measure with a time dimension (Jose & Lancaster, 1996). While the analysis of an individual firm's CCC is helpful, industry benchmarks are crucial for a company to evaluate its CCC performance and assess opportunities for improvement because the length of CCC may differ from industry to industry, the best check for CCC is to compare with Industry bench mark (Hutchinson, 2007). The cash conversion cycle is used as a comprehensive measure of working capital as it shows the time lag between expenditure for the purchase of raw materials and the collection for sales of finished goods (Padachi, 2006). Day-to-day management of a firm's short term assets and liabilities plays an important role in the success of the firm. Good liquidity management is the pointer to healthy bottom lines of Firms (Jose & Lancaster, 1996). According to Arnold (2008), the longer the CCC, the higher is the requirement for investment in working capital, however, a longer cycle could increase sales, which could lead to higher profitability. Authors like Shin and Soenen (1993) have argued that it is important for firms to shorten the CCC. A higher CCC can actually hurt a company's profitability by increasing the time that cash is tied to non-interest bearing accounts such as accounts receivables. By shortening the CCC the company's cash flows will have a higher net present value because cash is received quickly (Sharma & Kumar, 2011).

### **2.3 Review of Empirical Literatures**

This section of the study reviews the related empirical literatures with respect to working capital management and the profitability of Firms.

### **2.3.1 Accounts Receivable and Return on Assets**

Hailu and Venkateswarlu (2015) examined the effect of working capital management on firm's profitability evidence from manufacturing companies in Eastern Ethiopia spanning over the year 2010 to 2014, using a sample of 30 companies with total observations of 150. The results of their study indicates that a longer accounts receivable and inventory holding periods are associated with lower profitability. Laura and Marius (2014) examined the management of working capital and firm performance in the Romanian pharmaceutical sector, for year 2002-2012, the result of their study shows a significant negative, but weak relationship between working capital and firm profitability. This indicates that, the shorter the period between production and sale of products, the larger the firm's profitability.

Waler et al. (2014) examine the effect of working capital management on firm performance using a firm listed on the Zambawe staoock exchange for the period 2009-2013, using a sample of 39 firms from the eighteen sectors of the manufacturing companies. The findings of he study indicaes that account receivable have negative effect on profitability of the firm. Thus, the negative effect can be attributed to the capital market crises witness all over the world.

In a similar study conducted in Nigeria Ademola (2014) carried out a study on the impact of working capital management on profitability of he listed manufacturing companies in Nigeria over the period 2002 to 2011 using 120 firm-year observation. The result of the study indicates that net operating profit has significant positive relationship with profitability of the firm, while account collection period have significant negative relationship with profitability of the firm. Thus, this findings could be attributable to lack of conducting a normality test as none of the normality test was carried out.

Also, in another related study Mansoori and Muhammad (2012) investigated the effect of working capital management on firm profitability using a sample of Singapore firms from 2004-2011. After carried out the hausman speciation test he results of the study suggests that fixed effect was more appropriate. Therefore, the findings of the study indicates a significant positive relationship. Deloof (2003) examined the relationship between Working Capital Management, using a sample of 1009 non-financial Belgian companies for the year 1992 to 1996. The findings of the study indicated a significantly negative relationship between Gross Profits and the Average Period of Receivables, the Average Period of Inventories, and Average Period of Payables. Gamze, Ahmet & Emin (2012) investigated the effects of working capital management on firm's performance using 75 manufacturing firms listed on Istanbul Stock Exchange Market for the period 2002- 2009. The result of the study indicates that firms can increase profitability by shortening collection period of accounts receivable and cash conversion cycle.

Şamiloğlu & Demirgüneş (2008), examined the relationship between working capital management and firm profitability, using a sample of 5,843 firms of Istanbul Stock Exchange (ISE) over the period 1998-2007, the result of the study indicates that accounts receivables period, inventory period and leverage affect firm profitability negatively; while sales growth affects firm profitability positively. All cases reviewed concur in suggesting that accounts receivable affect firm profitability negatively.

### **2.3.2 Accounts Payable and Return on Assets**

In general, studies has shown links between payables and profitability whether positive or negative and whether the relationship is significant or not, the converging point is that there is a relationship. As such when managing working capital, management must be mindful of the fact that the way they manage payables can impact on the profitability of the firm either negatively or positively.

Ademola (2014) carried out a study in using 120 firm specific observation of food Beverages Company of listed manufacturing companies on the floor of Nigeria stock exchange over the period 2002-2011. Working capital management was proxies using average collection period, inventory conversion period and average payment period against return on asset of the companies. The results of the study indicate that account payment period show insignificant negative relationship with return on asset.

Rafiu and John (2014) carried ou study on the relationship between working capital management and profitability of the list manufacturing companies in Nigeria over the period 2000-2009. The study using 237 firm specific year observation for the nine years. The study found that working capital management has a significant impact on firms listed on the manufacturing companies in Nigeria. The results of the study indicates that account payment period has significant positive relationship with return on assets of the companies. Usama (2012) carried out a study on the impact of different proxies of WCM such as Average Collection Period (ACP), Average Payment Period (APP), and Inventory Turnover in Days (ITID), Cash Conversion Cycle (CCC), and Debt Ratio (DR) and firm performance proxied by ROA NOP and ROI and it was found that Average Payment Period (APP) has positive and significant impact on profitability.

In another related study Abera (2010) carried out a study on working capital management using Ethiopia 11 manufacturing companies listed on their stock exchange for the period 2005-2009. Working capital management was proxy with average payment period, while dependent variable was proxies using return on asset, return on equity and operating profit margin. The results of the study indicates that average payment period show insignificant negative relationship. The defects of the study could be attributed to the fact that the research use only private manufacturing firms. Usama (2012) carried out a study on the impact of different proxies of WCM such as Average Collection Period (ACP), Average Payment Period (APP), and Inventory Turnover in Days (ITID), Cash Conversion Cycle (CCC), and Debt Ratio (DR), Financial Assets to Total Assets Ratio (FATA), Current Ratio (CR) and Net Operating Profitability (NOP) of Karachi Stock Exchange using food industries. The study employed the uses of pooled least square regression and common effect model. The following results were obtained: (a) that there was a significant positive impact of WCM on profitability and liquidity of the firms; (b) Size of the firm has a significant positive impact on firm's profitability.

Binti and Binti (2010) examine the effect of working capital management and financial performance using 172 listed Malaysian firms. The result of the study shows that current ratio is negatively significant to financial performance of firms. Their study emphasized the importance of proper management of working capital as it affects firm's market value and profitability. According to them working capital management is part of the company's strategic and operational processes. Also, Eljely, (2004) empirically examined the relationship between liquidity and profitability as measured by current ratio and cash gap using 29 joint stock



companies in Saudi Arabia. The result of the study indicates a significant negative relation between the firm's profitability and its liquidity level, as measured by current ratio using correlation and regression analysis.

Mohammad and Noriza (2010) investigate the relationship between Working Capital Management (WCM) and performance of listed firms using 172 Malaysia firms. For the year (2003-2007). They analyse the working capital component of C.C.C., current ratio (C.R.), current asset to total asset ratio (C.A.T.A.R), current liabilities to total asset ratio (C.L.T.A.R.), and debt to asset ratio (D.T.A.R.) in effect to the firm's performance whereby firm's value dimension was taken as Tobin Q (T.Q.) and profitability. Therefore, return on asset (R.O.A.) and return on invested capital (R.O.I.C). The result of the study indicates a significant negative relationship between working capital variables and the firm's performance.

Saswata (2010) analysed that the importance of the fixed and current assets in running the organization. It was revealed that WCM has direct impacts on the profitability and liquidity using 30 United Kingdom based companies listed in the London Stock exchange for the year 2006-2008 was used. Most firms usually increase the margin of their profits so that they can shrink the size of their working capital on relation to sales. On the other hand if, the firms want to improve its liquidity they can then increase the size of their working capital. The result of the study shows that the dimensions of working capital management which comprises of quick ratios, current ratios C.C.C, average days of payment, Inventory turnover, and A.C.P (average collection period) on the net operating profitability of the UK companies has significant impact on firms performance.

Ganesan (2007) assesses the relationship between of telecommunication equipment industry and the effectiveness of working capital management using the sample of 443 annual financial statements of 349 telecommunication equipment companies for the years 2001 to 2007. The results of the study showed that “days of the working capital” negatively affects the profitability of these firms but in reality it does not affect the profitability of firms in telecommunication equipment industry. In financial issues of organizations, working capital management is a vital component, which has an immediate positive impact on benefit as well as liquidity of the organization, liquidity and profitability are both sides of the same coin, Genesan (2007).

### **2.3.3 Inventories Turnover and Return on Assets**

In all the studies, it is established that there exist a relationship between Inventory management and profitability as represented by different proxies of profitability. This is a pointer to the fact that whichever way management handle Inventory, it will impact at long run on the profitability of the organization either favorably or otherwise. Hence, the need to strife for efficiency in managing inventory, going by the fact that at long run it will impact on the firm’s performance. Ademola (2014) use the Nigeria companies listed on the manufacturing films to carry out a study on the relationship between working capital management and profitability. Using a 120 firm specific observation over the period 2002 -2011. The study use survey research design. Using ne operating profit as a proxy for the dependent variable, the result of the study indicates insignificant negative relationship. Adeleke and Mukolu (2013) carried out a study in Nigeria using 10 manufacturing firms that were listed on the floor of Nigeria stock exchange over the period 2004-20011. The result of the study indicates insignificant negative relationship, this

could be in association with the limited number of sample size. This can exhibit the generalization of the results.

In a similar study carried out by Panigrahi and Sharma (2013) on the relationship between working capital management and profitability of the listed India cement companies. The study covered the period between 2001 -2010. The study use return on asset as proxy for dependent while, working capital management was proxies using inventory turnover days. The results of the study indicate insignificant negative relationship between inventory conversion period and profitability of the firms. Thus, this indicates hat firm's sells their inventory, collect their receivable before they pay their payable. Ahmed (2010) investigated the impact of working capital management on the profitability of firms using a population of 1578 and a sample of 253 non financial listed companies of Karachi Stock Exchange (KSE), in Pakistan. The findings of the study indicated that out of the five selected components of working capital management only current asset over total sales showed significant negative relationship with both the proxies of profitability. While, current asset over total asset (CATA), inventory turnover, debtor's turnover and current ratio indicates a significant positive relationship with profitability.

Abdul, Talat, Abdul and Mahmood (2010) examine the impact of working capital management on firm's performance in Pakistan over the period 1998 to 2007, using 204 manufacturing firms. The results indicate that the cash conversion cycle, net trade cycle and inventory turnover in days are significantly affecting the performance of the firms. The manufacturing firms are in general facing problems with their collection and payment policies. Hence, the financial leverage, sales growth and firm size also have significant effect on the firm's profitability. In a similar study

Ahmed (2010) investigates the impact of working capital management on the performance of the firm using a population of 1578 and a sample of 253 non financial listed companies of Karachi Stock Exchange (KSE), in Pakistan. The net working capital can be shown as the excess of current assets in relation to current liabilities of a firm. This means it serves as the determinant of the strength of the business and the liquidity position. Therefore, the more, the working capital, the more liquid the firms are. Thus, WCM could be permanent or temporary; this implies that the former indicates the amount of current assets companies should possess for longer period of time in order to offset its current liabilities, while the later indicates the excess of current assets that meet seasonal current liabilities. Hence, the findings of the study indicated that out of the five selected components of working capital management only current asset over total sales showed significant negative relationship with both the proxies of performance. While, current asset over total asset (CATA), inventory turnover, debtor's turnover and current ratio indicates a significant positive relationship with performance, in addition, the Logistic regression results suggested that probability of firm being in profit is highly determined by CATA, CATS and CR.

Padachi (2006) examined the relationship between working capital management and firm's performance using 58 Mauritian small manufacturing firms for the year 1998 to 2003. The results shows that high investment in inventories and receivables is associated with low profitability and on the other hand it shows an increase in short term component of working capital financing. Much more, Afza and Nazir (2007) investigated the relationship between aggressive and conservative working capital policies using 205 firms in 17 sectors listed on Karachi Stock Exchange during 1998-2005. The result of the study indicates a significant negative relationship between the profitability measures of firms and degree of aggressiveness of working capital investment and financing policies.

#### **2.3.4 Cash Conversion Cycle (CCC) and Return on Assets**

One of the most important task business owners undertake mostly is to determine, estimate and evaluate cash flows of the business with the aim of identifying both the long run and short run cash inflows and outflows. Cash conversion cycle is a measurement tool of working capital management and the unit of measurement here is the number of days it takes to convert purchased stocks to finished goods and sale them out. Mohamad and Noriza (2010) examined the effect of working capital management on firms' profitability using Malaysian firms over the period 2003-2007 using secondary data from Bloomberg's 72 listed companies. Tobin's Q was used to measure the profitability ratio, return on invested capital and ROA. The results showed a significant negative relationship between working capital management and company's profitability.

While Haq, Muhammad, Khalid and Zaheer (2011) carried out a similar study in Pakistan on WCM of cement industry using a sample of 14 cement firms listed on Karachi Stock Exchange for the year 2004-2009. The estimated results of the study based on Pearson correlation and Pooled Ordinary Least Square Regression shows a moderate relationship between WCM and profitability of the firms. Furthermore, Karaduman, Halil, Arzu and Salih (2011) examined the relationship between WCM and profitability using 127 companies which gives a total of 635 observations of non-financial companies listed on Istanbul Stock Exchange. A balanced panel data analysis was used for CCC as a measure of WCM and ROA as a measure of profitability of firms, the result indicated that efficient management of CCC will give greater returns.

Ray (2012) used a sample of India manufacturing Firms over the period 1996-1997 and 2009-2010. The relationship between working capital management and profitability was investigated. The variables used for the study includes average collection period, inventory turnover in days, average payment period which constitute everything about working capital, therefore CCC. The proxies for profitability are NOP and ROA. The result of the study shows a strong negative relationship between the measures of WCM including the number of days accounts receivable and corporate profitability.

Mathuva (2010) examined the effect of elements of working capital management on profit of corporations using Kenya companies with the sample size of 30 firms which was listed on Nairobi stock exchange for the year 1993 to 2008. Using STATA to regress the data, fixed effect regression models were used. The result of the study indicated that, a significant negative relationship was found between the time period of converting stock into cash and profitability, and a significantly positive relationship was found between the time of payment of obligations of firms and profitability. Ali, Malik and Bukhari (2011) investigated the relationship between working capital management and profitability of Pakistan firms using textile sector, a sample of 160 textile firms over a period of 6 years (2000-2005). The result of the study further shows a significant positive relationship between return on asset and cash conversion cycle.

Mohammad and Mahum (2014) investigated the impact of working capital management (WCM) on corporate profitability in cement, chemical and engineering sectors of Pakistan, using a sample of 38 firms from Cement, Chemical and Engineering sectors of Pakistan listed on KSE with a balanced panel data set of 185 firm for the year 2007-2011. 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 profitability. The result of the study shows that average payment period is negatively and significantly related to profitability whereas cash conversion cycle is positively significant and relate with return on equity. While, average collection period and operating cycle is positively related to ROE even though insignificantly, whereas, average age of inventory is negatively related to ROE even though insignificant. Vural, Sokmen and Cetenak (2012) examined the relationship between working capital management and firm's performance by studying five different models used in measuring WCM, using 75 companies from Istanbul stock exchange over the period 2002-2009. Tobin's Q and operating profit were used as proxies for profitability and firm value. The results of the study indicated that, cash conversion cycle and average collection period shows a significant negative relationship with profitability.

Taghizadeh, Akbari, Khosroshahi & Ghanavati (2012) investigated the effect of working capital management over the performance of 50 firms Listed in Tehran Stock Exchange (TSE) over the period 2006 and 2009 by using a multi-regression model. In trying to measure the working capital management the following variables were used; Average Collection Period, Inventory Turnover in days, Average Payment Period, Cash Conversion Cycle and Net Trading Cycle, while net operating profit was used as the dependent variable. The result of the study showed that, there is a significant negative relationship between the variables of Average Collection Period, Inventory Turnover in day, Average Payment Period, Net Trading Cycle and the profitability of firms Listed in Tehran Stock Exchange (TSE).

Nazir and Afza (2009) investigated the relationship between WCM policies and a firm's profitability using non-financial firms listed on the Karachi Stock Exchange (KSE) over the period 1998 to 2005. The findings of the study showed a significant negative relationship between CATAR with firm's profitability. The study also found a significant negative relationship between WCM and firm's profitability.

Afeef (2011) in Pakistani examined the relationship between WCM on the profitability of Small and Medium-sized enterprise (SME). The findings of the study shows there is insignificant relationship between indicators of WCM and Liquidity and the ROA. Mousavi and Jari (2012) examined the relationship between working capital management and firm performance from Iran using working capital management as one of the most important financial decisions in corporate performance. It was found that there are positive relationship between working capital management and corporate profitability as proxied by ROA. Stubelj and Laporšek (2016) examined the impact of working capital policy on firm's performance and capital requirements using 50.000 Slovenian firms divided in 19 industry sectors, differentiated by size and number of employees over the period 1995 to 2014. The result of the study shows a significant positive relationship between WCM and ROA. Muhammad and Syed (2012) examined the relationship between working Capital Management and Firms' profitability of non-financial institutions listed in Karachi Stock Exchange (KSE-30) Index. The result of the study indicated that, working capital management has significant impact on firms' profitability.

#### **2.4 Concept of Profitability.**

There has been various measures of Profitability, for example return on sales reveals how much a company earns in relation to its sales, return on assets determines an organization's ability to make use of its assets and return on equity reveals what return investors take for their investments (Ebaid, 2009 and Abor, 2005) as reported by Lucy Wamugo Mwaingi & Muathe



Stephen Makau (2014). Traditionally, the success of a manufacturing system or company can be evaluated by the use of financial measures (Tangen, 2003).

Liquidity measures the ability of the business to meet financial obligations as they fall due, without disrupting the normal operations of the business (Kisimili & Gunay, 2011). Solvency measures the amount of borrowed capital used by the business relative to the amount of owner's equity capital invested in the business (Harrington & Wilson, 1989). Solvency measures and provides an indication of the business's ability to repay all indebtedness if all of the assets were sold. Solvency measures also provide an indication of the business's ability to withstand risks by providing information about the firm's ability to continue operating after a major financial adversity (Harrington & Wilson, 1989).

The short-term ability to generate a positive cash flow margin does not guarantee long-term survival (Jelic & Briston, 2001).

Financial efficiency measures the degree of efficiency in using labor, management and capital. Efficiency analysis deals with the relationships between inputs and outputs. Because inputs can be measured in both physical and financial terms, a large number of efficiency measures in addition to financial measures are usually possible (Tangen, 2003). Profitability is a function of the stakeholders' point of view (Ebaid, 2009), hence, there are several measures of profitability ranging from return on sales, return on equity, return on asset etc.

## **2.5 Theoretical Framework**

Trade Credit theory –Trade credit is the credit extended by one trader to another for the purchase of goods and services (Ferris, 1981 and Mitchell, et al, 1997). Trade credit facilitates the

purchase of supplies without immediate payment. Trade credit is commonly used by business organisations as a source of short term financing (Babich, et al, 2012). The trade credit theory has been proposed to cushion the effect of account payable or account receivables which the creditors and debtors may encounter in the course of their business transactions. Trade credit can either be given by a supplier in the form of accounts receivables, or can be received by a customer in the form of accounts payables. Here, firms are sure of being financed by their suppliers rather than financial institutions. Study have shown reasons why firms decide to receive or to grant trade credit based on the advantages of either the supplier or customer, from the operational, commercial and financial perspective (Kowelis & Zhao, 2012). Trade credit eliminates precautionary motives for holding cash (Chludek, 2010). For that which is to be bought with cash can be sourced through trade credit, hence the need to hold cash with the aim of taking precaution against our trade needs does not hold any longer. Firms use trade credit when credit from financial institutions are limited or not readily available (Petersen et al, 1996). The non-availability may be process inherent or as a result of liquidity crunch in the financial sector. Suppliers lend to firms no one else lends to because they may have a comparative advantage in getting information about buyers cheaply, they have a better ability to liquidate goods and they have a greater implicit equity stake in the firm's long term survival (Mezin, et al, 2007). Firms with better access to credit from financial institutions are found to offer more trade credit thereby serving as intermediaries to firms that have limited access to credit from financial institutions (Petersen & Rajan, 1996).

In a study trying to establish grounds for trade credit and inventory holding cost, it was found that granting trade credit can serve as a trade-off between the holding cost of goods produced but

unsold and the benefits of cash sales (Mezin, et al, 2007). However, Daripa & Nilsen (2005) found that suppliers grant trade credit as an incentive for buyers to hold more inventory thereby shifting inventory holding cost from sellers to buyers. Even at that, they still point out that trade credit has forgone alternative cost as the seller has to forgo cash with which they are to settle their own creditors. Here, they pointed out that by granting trade credit, the seller is trading-off potential future cash sales opportunities. It was also found that firms usually trade credit to financially constrained customers to obtain additional sales in the face of uncertain demand for its products (Robb & Silver, 2006). Ellingsen, et al (2004) found that trade credit is more prevalent in developed Economies than less developed economies where collaterals cannot guarantee the cost of goods extended on credit. Studies that tried to establish links between trade credit and periods of financial crisis has the following to report:

Zubair and Kabir (2015) found that during financial crisis, trade credit serves as complimentary source of finance for firms. Cassey and O'toole (2015) found out that firms that are denied credit for working capital tend to turn to trade credit while inter-company lending tends to act as substitutes for Bank investment Loans. However, an earlier research carried out by Love & Zubair (2010) point out that trade credit does not substitute for Bank credit during financial crisis. Ghosh and Saibal (2015) found out that there are more evidence in favour of trade credit than Bank credit during financial crisis. Grave & Thomas (2011) found no evidence to the effect that trade credit will serve as a shock absorber for Bank credit in the event of financial crisis. In a study that tried to establish relationship between trade credit and risk, it was found that trade credit can serve as a shock absorber or an amplifier of contagion risk (Giovennatti, 2017).

In another study that tried to establish relationships between trade credit, profitability and liquidity, it was found that firms that grant trade credit are more liquid and profitable than firms that don't, the findings pointed out that firms with windows for trade credit are found to have higher current assets ratio, profit margin and cash ratio (Deari and Pintea, 2017).

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter discusses the methodology that was used in this study. This therefore include; research design, population, sample size and sample selection techniques used, sources of data and method of data collection, model specification and tools of data analysis employed in the course of carrying out the research.

#### **3.2 Research Design**

The study adopts correlation research design. The correlation research design is used to describe the relationship between two or more variables. For this study, correlation research design is used to test the strength and direction on the relationship between Working Capital Management and Firm Profitability. The explained variable in this study is ROA, while the explanatory variables are ARD, ITO, APD and CCC. The period for the study is Eight (8) years, that is, from 2009 to 2016. The design is sufficient and suitable for determining the relationship that exists between working capital management and profitability of listed Industrial Goods Firms in Nigeria. However, multicollinearity is expected among the explanatory variables, as such, further test will be carried out to check for multicollinearity, goodness of fit (Robustness test), tolerance level and Variance Inflation Factor (VIF) after testing to determine whether the data are normally distributed.

### **3.2.1 Normality Testing**

To test whether the data are normally distributed, a normality test will be carried out to find out whether both the dependent and independent variables have a normal distribution (Kiswara, 2010).

### **3.2.2 Correlation Test**

The test here shall be aimed at determining the relationship between Dependent Variable Return on Assets (ROA) and the Independent Variables Accounts Receivable Days (ARD), Accounts Payable Days (APD), Inventory Turnover (ITO) and Cash Conversion Circle (CCC). The relationship shall indicate how much of each Independent Variable impact on a unit of the Dependent Variable.

### **3.2.3 Robustness Test**

The study conducted Goodness of Fit test, Heteroscedasticity test and Hausman Specification test. The test is aimed at giving Validity and Reliability to the Statistical Inference that shall be drawn from the study.

## **3.3 Population and Sample Size of the Study.**

The population of the study consists of all the twenty one industrial goods firms quoted on the Nigeria Stock Exchange for a period of Nine (9) years from 2009 to 2016. However, a filter is employed to eliminate any that was suspended on the floor of Nigerian stock exchange within the period of the study; consequently Five (5) firms were filtered out remaining Sixteen (16). Another filter was employed to eliminate any company that did not make available its financial statement to the Nigerian Stock within the period of the study, hence, One (1) firm was

eliminated leaving Fifteen (15). However, the remaining Fifteen (15) were used as our adjusted population for the study, (See Appendix C).

### **3.4 Sources and Method of Data Collection**

The study used panel data mainly from secondary sources because it is a quantitative study with positivism paradigm and the core of the data needed for analysis can be adequately extracted from the audited financial reports and accounts of the selected firms within the period of the study. However, the adoption of the secondary source of data collection was prompted by the requirement of the model and tool of analysis. All the data in respect of both dependent and independent variables will be extracted from the audited annual reports and accounts of the selected sampled firms. The data collected consist of information on return on assets (ROA), accounts receivable (ARD), inventory turnover (ITO), accounts payable (APD) and cash conversion cycle (CCC). The data so collected were further processed to give us the exact data that will be used for the OLS regression.

### **3.5 Techniques of Data Analysis**

For the purpose of this study multiple regressions was employed as a technique for data analysis. The technique was preferred because of its ability to explain the association between two or more independent variables and the dependent variable. Therefore, it is found appropriate for a study of this nature with four independent variables (account receivables, account payables, inventory turnover and cash conversion cycle) one dependent variable Return on Assets (ROA) and firm size as control variable. The justification for use of Firm Size as a Control Variable is to

mitigate for difference in Size of the Companies in the Industrial Goods Firms bearing in mind that all the Firms have different Asset Size.

### 3.6 Variable Measurement and Model Specification

The study makes use of return on asset (ROA) as the dependent variable and the independent variables are: inventories turnover days (ITO), account receivable days (ARD), Account Payable Days (APD) and Cash Conversion Cycle (CCC). Both the dependent and the independent variables are measured as contained in Table 3.1

**Table 3.1: Variable Measurement**

Variable	Variable name	Variable measurement	Sources
<b>ROA</b>	Return on Asset	Profit after tax divided by total assets	Woolf (2008)
<b>ITO</b>	Inventory Turnover Days	Cost of Goods sold/Average Inventory *365	Abdul, Talat, Abdul and Mahmood (2010) and Ahmed (2010)
<b>ARD</b>	Account Receivable Days	Account Receivable /sales*365	Gamze, Ahmet and Emin (2012) and Hailu and Venkateswarlu (2015)
<b>APD</b>	Account Payable Days	Account payable/ cost of Goods sold*365	Usama (2012) and Saswata (2010).
<b>CCC</b>	Cash conversion cycle	ARD+ITO-APD	Haq, Muhammad, Khalid & Zaheer (2011) and Ray (2012)
<b>F<sub>SIZE</sub></b>	Firm Size	Ln(Total Assets)	Makori & Jagongo (2013)

**Sources: compiled by the author, 2018**

To examine the impact of working capital management on performance of industrial goods firms, a multiple linear regression static model used for analyzing panel data which capture all



variables (Dependent, Independent and Control Variables) was used to capture the dependent variable return on asset (ROA) and the independent variables inventories turnover days (ITO), account receivable days (ARD), Account Payable Days (APD) and Cash Conversion Cycle (CCC).

$$ROA_{it} = \beta_0 + \beta_1 ITO_{it} + \beta_2 ARD_{it} + \beta_3 APD_{it} + \beta_4 CCC_{it} + \beta_5 Fsize_{it} + \varepsilon_{it} \dots \quad - \quad - (1)$$

$$ROA = \beta_0 + \beta_1 ARD_{it} + \beta_1 ITO_{it} + \beta_1 APD_{it} + \beta_1 CCC_{it} + \beta_2 Fsize_{it} + \varepsilon_{it} \dots \quad - \quad - (2)$$

### 3.6.1 Model Specification

The CCC was included in Model 2 even though CCC is replicated by ARD, ITO and APD, its inclusion may lead to a high degree of multicollinearity among the working capital management variable as was shown by the variance inflation factors (VIF) in (Curto and pinto, 2008) as cited by Ambrose Jagongo and Daniel Mogaka Makori (2013). However, this may not be harmful to the explanatory variables, as such a multicollinearity test has to be conducted to test for harmful multicollinearity among the explanatory variables by observing the tolerance values and the variance inflation factor (VIF). The parameters in the regression models 1 and 2 are specify and explained as below;

Where:

$RAO_{it}$  = Return on Asset

$ITO_{it}$  = Inventories Turnover Days

$ARD_{it}$  = Account Receivable Days

$APD_{it}$  = Account Payable Days

$CCC_{it}$  = Cash Conversion Cycle

$Fsize_{it}$  = Firm size

$i = i$ th term denoting the number of firms from 1-15

$t = t$ th term denoting the time period ranging from 2009-2016.

$\varepsilon_{it}$  = error term of the model

$\beta_0$  = intercept of the regression equation

$\beta_1 - \beta_4$  = are the coefficient of the parameter estimate

## **CHAPTER FOUR**

### **DATA PRESENTATION, ANALYSIS AND INTERPRETATION**

#### **4.1 Introduction**

This chapter contains the analysis of the descriptive statistics, this is followed by the presentation of the result, analysis and interpretation of the data extracted with a view to testing the model adopted in this study. The findings are also discussed and policy implications are drawn from the findings. The chapter ends with a discussion on the various robustness tests for the dependent and the independent variables of the study.

#### **4.2 Data Presentation**

The data collected in respect of this work are as presented in Appendix C. The data were collected from Secondary Source (Annual Accounts and Reports) Fact Book on the respective Companies in the Industrial Goods Firms. The data were modified to fit the purpose of this research. The data as collected shall be subjected to analysis with the aim of achieving the purpose of this research.

#### **4.3 Descriptive Statistics**

The descriptive statistics is presented in table 4.1, it provides the summary of the minimum, maximum, mean and standard deviation of the data for the variables used in the study. The full result is attached as appendix B.

**Table 4.1 Descriptive Statistics**

<b>Statistics</b>	<b>Min</b>	<b>Max</b>	<b>Mean</b>	<b>Std. Dev</b>	<b>Skewness</b>	<b>Kurtosis</b>
<b>ROA</b>	-12.9631	45.13098	35.34678	8.197877	2.497439	10.41736
<b>ITO</b>	0.039427	7.374495	0.7741527	0.9861107	3.958235	22.96132
<b>ARD</b>	0.8678861	4.895925	3.146552	0.9508836	0.0147116	2.184866
<b>APD</b>	1.001316	5.573143	2.967361	1.214121	0.2258239	2.192612
<b>CCC</b>	0.2191326	4.895925	2.911197	1.26525	-0.5562922	2.639912
<b>FS</b>	0.0140006	1.013704	0.2312203	0.2544229	1.042209	3.035629

**Source: STATA Output**

Table 4.1 presents and shows the details of the accounts of descriptive statistics for the dependent variable (ROA) and independent variables inventory turnover day (ITO), account receivable day (ARD), account payable day (APD) and cash conversion cycle (CCC). It is clear that there is wide variation between the ROA standard deviation of approximately 8.197877 and the mean of approximately 35.34678, the wide variation is a function of the negative minimum value of -12.9631. This negative minimum suggested that the ROA of the Industrial Goods Firms in Nigeria resulted into some losses during the period under review.

While the mean value of 35.34678 as well as the standard deviation value of 8.197877 means that there is variation in the firm performance. The standard deviation indicates the movement of the return on asset between the minimum and the maximum, the higher the value of the standard deviation the higher would be the rate of deviation from the mean by implication. However, the skewness of (2.497439) which implies that the distribution is skewed to the right and a kurtosis

of (10.41736) suggest that the distribution is not normal or perfectly symmetrical but Leptokurtic, since the Kurtosis is greater than 3.

Similarly, the table indicates that the inventory turnover days from the sample of Industrial Goods Firms in Nigeria has an average value of 0.7741527 days a standard deviation of 0.9861107 days and minimum value of 0.0394. The maximum of 7.374495, is an indication of the fact that stocks are not kept too long, it is kept maximally for Eight (8) days, the standard deviation value of the sample Industrial Goods Firms deviate from the mean value from both sides by Nine (9) or approximately Ten (10) days which implies that there is average dispersed data from the mean because the standard deviation is not too large. The result of the skewness is (3.958235) and kurtosis (22.96132), this statistical result indicates that the data is skewed to the right this is another pointer to the fact that the data is not normally distributed. Also, with a kurtosis of 22.96132, it suggest that we have a Leptokurtic distribution as the data are not normally distributed, this is a confirmation of the inference drawn from the result of skewness.

Similarly, from table 4.1, it can be seen that the mean of the account receivable days of the sample quoted Industrial Goods Firms in Nigeria is 3.146552 days with the standard deviation of 0.9508836 days with a minimum value of 0.8678861 and maximum value of 4.895925, this shows that Account Receivable Days of the sample Industrial Goods Firms is on average of Three (3) days. The maximum is approximately Five (5) days while the minimum of advance payment of approximately One (1) day. The standard deviation value shows that the sampled firms' Account Receivable (ARD) deviates from the mean value from both sides by approximately Two (2) days. This implies that there is significant dispersion of the data from the

mean because the standard deviation is not too large. The result of the skewness is (0.0147116) and kurtosis (2.184866), the statistical result indicates that the data is skewed to the right this depicts that the data is not normally distributed. However, a kurtosis of (2.184866) which is less than Three (3) suggest that we have a platykurtic distribution from the data.

The table 4.1 also indicates that the mean of the Account Payable days of the sample Industrial Goods Firms is 2.967361 days, while the standard deviation is 1.214121 day. The minimum value is 1.001316 and maximum value of 5.573143 days for the company to pay their suppliers. This indicates that the performance of Industrial Goods Firms in respect to the time taken to pay their supplies is on the average of approximately Three (3) days and maximum of approximately Six (6) days. The standard deviation value shows that the Firms Account Payable Days deviate from both side of the mean by more than a day. This indicates a significant level of dispersion from the mean even though it is not too high. The result of the skewness is (0.2258239) which suggest that data distribution is skewed to the right and a kurtosis of (2.192612) suggesting that we have a platykurtic shape of the distribution, this is also a confirmation of lack of normality in the distribution of the data.

In the same vein, table 4.1 shows that the mean of the Cash Conversion Cycle (CCC) of the sampled Industrial Goods Firms is 2.911197 which indicated a good working capital management with standard deviation of 1.26525 day. The minimum of 0.2191326 and maximum of 4.895925, this imply that the minimum and the maximum days to recover cash from sales are approximately less than One (1) day and Five (5) days respectively. This shows that Cash Conversion Cycle of the sampled Firms deviates from the mean value from both sides by

approximately one (1) day, meaning that there is less significant dispersion of the data from the mean because the standard deviation is not too high. However, the skewness of (-0.5562922) suggest that data distribution is skewed to the left and a kurtosis of (2.639912) suggest that the data distribution took a platykurtic shape. Statistics of Skewness and Kurtosis provides useful information about how symmetrical and or asymmetrical the data of the study are? It also indicates the probability distribution of the various data as well as the thickness of the tails of the distribution respectively.

The following Table 4.2 present the results of normality test conducted;

**Table 4.2: Normality Test**

<b>Variables</b>	<b>Z</b>	<b>P-Values</b>
<b>ROA</b>	9.66	0.00000
<b>ITO</b>	8.001	0.00000
<b>ARD</b>	2.229	0.01290
<b>APD</b>	2.725	0.00321
<b>CCC</b>	3.579	0.00017
<b>FS</b>	5.917	0.00000

**Source: STATA Output**

Under Shapiro-Wilk (W) test for normal data, null hypothesis principle is used to check a variable that came from a normally distributed population (the null hypothesis of the test is that, the data is normally distributed). Table 4.2 indicates that data from ROA, ITO, ARD, APD and CCC variables of the study did not follow the normal distribution, because the P-values of the

test statistics (Z-Values) are statistically significant at 1% level of significance. Thus, the null hypotheses (that is, the data is normally distributed) are rejected for ROA, ITO, ARD, APD and CCC variables. However, the Guassian theorem (1929) and Shao (2003) suggested that non-normality of data will not in any way affect any of the inferential statistics for it is the error terms that are expected to be normally distributed, the dependent variable need not be normally distributed. Now, having analyzed the descriptive statistics, normal distribution test of the data, the inferential statistics of the data collected from which the hypotheses of the study are tested are presented and interpreted in the following section with the aid of the correlation matrix and regression results as obtained.

#### **4.4 Correlation Matrix**

The essence of correlation matrix is to explain the degree of the relationship between the dependent and independent variables of the study as well as the independent variables among themselves. The summary of the associations among the variables of the study is presented in table 4.3 and the full result is attached as Appendix A.



**Table 4.3 Correlation Matrix**

<b>Variables</b>	<b>ROA</b>	<b>ARD</b>	<b>APD</b>	<b>ITO</b>	<b>CCC</b>	<b>FS</b>
<b>ROA</b>	1.0000					
<b>ARD</b>	0.539	1.0000				
<b>APD</b>	-0.0991	-0.3160	1.0000			
<b>ITO</b>	-.0756	0.1819	-0.3276	1.0000		
<b>CCC</b>	0.1464	0.1548	0.1450	0.3257	1.000	
<b>FS</b>	-0.1505	-0.1546	0.1499	-0.2878	0.1085	1.000

*Source: STATA Output*

The results in Table 4.3 shows the degree of association between Firm Profitability (ROA) and all pairs of independent variables individually and between themselves and cumulatively with the dependent variable Return on Assets (ROA) of the study in the Industrial Goods Firms sector. The table presents a positive relationship between (ROA) and Average Receivables (ARD) from the correlation coefficient of 0.539. This relationship implies that as the number of days to receive money from the debtors increases the profitability will also increase for the sample firms. Table 4.3 shows that there is negative association between ROA of the Industrial Goods Firms and Average Payables (APD) of the sample firms, from the correlation coefficient of -0.0991. This relationship implies that as the numbers of days to make payment to our supplies is shortened, the profitability will decreases.

Similarly, Table 4.3 indicates a negative correlation between ROA and Inventory (ITO) from the correlation coefficient of -0.0756. This relationship implies that as the amount of stock holding by the firm increases the return on asset will decrease, here, profit can be depleted by holding

cost, carrying cost and obsolesce. The table also indicates a positive association between ROA and cash conversion cycle (CCC) from the correlation coefficient of 0.1464. Table 4.3 also shows a negative relationship between ROA and Firm size (FSZ) which is a control variable in this study with a correlation coefficient of -0.1505.

The analysis of the relationships between dependent variable ROA and all the independent variables and between independent variables themselves indicated that some are positive and some are negative; However, to conclude on the relationship and the impact of the dependent variable (ROA) and all the pairs of independent variables (average receivables, average payables, average inventory turnover and cash conversion cycle) of Nigerian industrial goods sector, the regression model of the study is further analyzed by conducting a robustness test as shown in Table 4.4.

#### **4.5 Robustness test of Dependent and Independent Variables**

In order to ensure the reliability and validity of the statistical inference, this section of the study presents and discusses Robustness tests such as Multicollinearity, Heteroscedasticity test, Hausmann specification test as it is shown in Table 4.4 below.

**Table 4.4: Normality Test**

<b>Variables</b>	<b>VIF</b>	<b>Tolerance Values</b>
<b>ARD</b>	1.19	0.841267
<b>APD</b>	1.36	0.736157
<b>ITO</b>	1.49	0.672883
<b>CCC</b>	1.34	0.745955
<b>FSZ</b>	1.17	0.853396
<b>Mean VIF</b>		<b>1.31</b>
<b>Hetest Chi2</b>		<b>453.72</b>
<b>Hetest Sig</b>		<b>0.000</b>
<b>Hausman Chi2</b>		<b>1.46</b>
<b>Hausman Sig</b>		<b>0.9179</b>
<b>LM Test Chibar2</b>		<b>0.000</b>
<b>LM Sig</b>		<b>1.0000</b>

**SOURCE: STATA OUTPUT**

**Multicollinearity Test:** From table 4.4 the multicollinearity test is carried out to view whether there is a correlation among the independent variables which may affect the result of the study. The tolerance value and variance inflation factor (VIF) are two advanced measures for assessing harmful multicollinearity among the explanatory variables. From the result of the study the variance inflation factors and tolerance values are concurrently less than ten and less than one respectively, this indicates the absence of harmful multicollinearity. This shows that the model fit the study very well.

**Heteroscedasticity Test:** Table 4.4: the result of the study obtained indicated that the chi-square value is large (453.72) and the p-value is small (0.000). Therefore this indicates that there is no constant variance. This shows there is the need to conduct Hausman specification test in order to decide between fixed and random effects that would be more appropriate.

**Hausman Specification Test:** The Hausman test was conducted for the study where both fixed and random effect test was carried out, the test for the Hausman indicated a clear difference; the random effect may be preferred over the fixed effect. The result of the Hausman test indicated that P-value is greater than 0.9179. Therefore, based on that, the result of the random effect model regression result is hereby preferred over the fixed effect model

#### **4.6 Presentation, Analysis and Discussion of Regression Results**

In view of the fact that the result obtained from the hausman specification test favour random effect model, therefore, the result obtained from GLS will be used and interpreted. Table 4.4 below presents summary of Regression results.

**Table 4.5 Summary of Regression Results**

<b>Variables</b>	<b>Beta Coefficient</b>	<b>t-values</b>	<b>Sig</b>	<b>VIF</b>	<b>1/VIF</b>
<b>ARD</b>	89.14817	5.97	0.000	1.36	0.841267
<b>APD</b>	-11.8755	-0.30	0.766	1.19	0.736157
<b>ITO</b>	-297.0955	-2.92	0.004	1.49	0.672883
<b>CCC</b>	44.0434	1.93	0.054	1.36	0.745955
<b>Fsz</b>	-240.8686	1.91	0.059	1.17	0.853396
<b>Constant</b>	-432.6065	-1.39	0.164		
<b>R<sup>2</sup></b>					0.3588
<b>F-Statistic</b>					54.84
<b>F-Sig</b>					0.000

**Source: STATA Output**

The cumulative R<sup>2</sup> (0.3588) which is the multiple coefficient of determination gives the proportion or percentage of the total variation in the dependent variable (ROA) as explained by the independent variables (Average Receivables, Average Payables, Average Inventory Turnover and Cash Conversion Cycle) jointly. Hence, it signifies 35% of total variation in financial performance of Nigerian Industrial Goods Firms is caused by the collective effort of average receivables; average payables; average inventory turnover and cash conversion cycle). This further indicates that the model is fit, variables properly selected, combined and used in the study. This is statistically supported by the F-Sig (0.0000).

#### **4.6.1 Average Receivables and Profitability**

From table above (4.4), it is observed that the t-value for Average Receivable (ARD) is 5.97 and a coefficient value of 89.14817 with a significant value of 0.000. This signifies that average receivable is positively and significantly influencing Profitability of Industrial Goods Firms listed on the Nigerian stock. This implies that it is a day delay in account receivable will result in an 89.14 increase in profitability. In other words this result implies that any delay by the debtors to settle their liability of the goods they have taken on credit from the company will increase the Profitability of the Firm. This is not surprising considering the fact that account receivables has to do with the debtors collection i.e. the ability of the firm to recover its debt from the debtors of the company. However, an increase on the average number of days accounts receivable by a firm to the debtors. May result to a problem because the inability of the debtor to settle their debt on time will constrained the firms in performing her operation as it affect firm liquidity. Thus, the finding of this study which shows that average receivables have a significant effect on the Profitability of Industrial Goods Firms gives an evidence of rejecting the first ( $H_{01}$ ) null hypothesis of the study which states that, account receivables has no significant effect on the return on asset of Industrial Goods Firms; thus;  $H_{01}$  is hereby rejected. This finding is consistent with the finding of (Marc Deloof, Ganze, Ahmet and Emin, 2012 and Laura & Marius, 2014; Ahmed, 2010 & Abdul, Talat, Abdul & Mahmood, 2010) and contrary to the finding of (Mathuya, 2013 and Igbal & Zhuquan, 2014; Mahamad & Noriza 2010 and Ray, 2012).

#### **4.6.2 Account Payables and Profitability**

The regression result reveals that the account payable days of quoted industrial goods Firms in Nigeria has a beta coefficient of -11.8755 with a t-value of -0.30, which was found to be

insignificant at any level of significance. This implies that for industrial goods firms in Nigeria to have a unit increase in ROA, the APD must be decreased by 11.8755days. When a firm decides to delay settling its obligation to its suppliers, it will have a negative impact on its performance by decreasing the return on its asset. On the other hand, the result signifies that any single delay by a firm to settle its suppliers gives the firm an advantage of investing the amount into more profitable investments that may generate a good return on asset to the firm which will improve performance but this is not statistically significant. The result of the study shows that account payable days has an inverse (negative) relationship but not significant influence on the return on asset of listed industrial goods companies in Nigeria. Therefore,  $H_{02}$ ; which states that account payable has no significant impact on the return on asset of industrial goods firms is hereby not rejected. Thus;  $H_{02}$  is hereby not rejected, several studies has suggested that relationships exist between payables and profitability of firms, hence the need to manage payables. Iqbal, N (2014) said “there is a positive relationship between payables and profitability of firms”. Van Nhan, H (2017) pointed out that less profitable firms wait longer to pay their bills. While Deloof, M (2003, p.258) said “the negative relationship between accounts payable and profitability is consistent with the view that less profitable entities wait longer to pay their bills”. This indicates that profitability is affected by payables policy and not vice versa. Gill (2010) said the inverse correlation between payables and profitability is contrary to the theory that advocates extending payment terms as a means of managing working capital with the aim of improving liquidity and profitability. This finding contradict the finding of Genesan (2007) and support the finding of (Usama 2012; Binti and Binti 2010; Muhammad & Noria 2010 and Saswata 2010)

#### **4.6.3 Average Inventory and Profitability**

From table 4.4 the Inventory Turnover days have a significant positive impact on the profitability of the quoted Industrial Goods Firms in Nigeria at 1% level of significance which is in line with prior expectations and is also consistent with the study of (Abdul, Talat, Abdul and Mahmood, (2010). This is represented by a t-value of (-2.92) and a beta coefficient value of -297.0955 which has a significant probability value of 0.004. This result implies that for every 1% increase in the inventory turnover held by a firm in order to meet unexpected demand it will have a negative significant impact on the level of profitability of the Industrial Goods Firms listed in Nigeria. Better still, the result tends to imply that for the Industrial Goods Firms in Nigeria to have a unit increase on ROA, there must be a decrease of 297.0955 units of inventory, this has provided sufficient evidence for rejecting the third ( $H_{03}$ ) null hypothesis of the study which stated that; there is no significant relationship between average inventory turnover Days (ITO) and firm's profitability of industrial goods firms in Nigeria, thus  $H_{03}$  is hereby rejected. (Abdul, Talat, Abdul and Mahmood, (2010) and Ahmed, 2010).

#### **4.6.4 Cash Conversion Cycle and Profitability**

Finally, looking at the relation between cash conversion cycle and the return on asset, a positive relation emerged and this has been supported statistically at 1% level of significance. This relation is evidenced by the coefficient value of 44.0434 and a t-value of 1.93. Here, it implies that to have a unit change in ROA, we need to have 44.0434 unit increase in the CCC. Therefore, the cash conversion cycle is relevant and play a significant role in improving the performance of industrial goods firms in Nigeria and this is in conformity with financing advantage theory where firms take advantage over traditional lenders (Joana, Vitorino & Moreira, 2011). The result of



the cash conversion cycle gives evidence of rejecting the fourth null hypothesis  $H_{04}$  which says cash conversion cycle has no significant impact on the profitability of industrial goods firms in Nigeria. Thus;  $H_{04}$  is hereby rejected.

#### **4.6.5 Discussion of findings**

From the result of the study it indicates that the Average Receivable day (ARD) has significant positive relationship with return on asset. This implies that average receivable is positively and significantly influencing Profitability of Industrial Goods Firms listed on the Nigerian stock. Considering the beta coefficient and the table value, it implies that it is a day delay in account receivable that resulted 89.14 increases in profitability. Thus, it's also indicates that any delay by the debtors to settle their liability of the goods they have taken on credit from the company may constrained an increase the Profitability of the Firm. This finding is consistent with the finding of (Marc Deloof, Ganze, Ahmet and Emin, 2012 and Laura & Marius, 2014; Ahmed, 2010 & Abdul, Talat, Abdul & Mahmood, 2010) and contrary to the finding of (Mathuya, 2013 and Iqbal & Zhuquan, 2014; Mahamad & Noriza 2010 and Ray, 2012).

Consequently, from the result of the study it reveals that the account payable days of quoted industrial goods Firms in Nigeria has decrease the profitability of industrial goods firms in Nigeria. Looking at the beta coefficient of -11.8755 with a t-value of -0.30, which was found to be insignificant at any level of significance. This means that for industrial goods firms in Nigeria to have a unit increase in ROA, the APD must be decreased by 11.8755days as the firm decides to delay settling its obligation to its suppliers this finding is in line with that of Iqbal (2014) who said "there is a positive relationship between payables and profitability of firms". (Van Nhan,

2017; Deloof; 2003:258; Gill (2010) and contradict the finding of (Genesan, 2007; Usama 2012; Binti and Binti 2010; Muhammad & Noria 2010 and Saswata 2010).

From the result of the study Inventory Turnover days have a significant positive impact on the profitability of the quoted Industrial Goods Firms in Nigeria. This result implies that for every 1% increase in the inventory turnover held by a firm in order to meet unexpected demand it will have a negative significant impact on the level of profitability of the Industrial Goods Firms listed in Nigeria. Better still; the result tends to imply that for the Industrial Goods Firms in Nigeria to have a unit increase on ROA. This is in consistent with the study of (Abdul, Talat, Abdul and Mahmood, (2010) and contradict the finding of (Abdul, Talat, Abdul and Mahmood, 2010 & Ahmed, 2010).

The result of the study between cash conversion cycle and return on asset indicate a significant positive relationship. This is supported by the coefficient value of 44.0434 and a t-value of 1.93. This implies that any unit change in ROA will result to 44.0434 unit increase in the CCC. Therefore, this shows that cash conversion cycle is relevant in playing a significant role of improving the performance of industrial goods firms in Nigeria and this is inconsistent with the findings of (Joana, Vitorino & Moreira, 2011).

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 Summary**

The study examines the impact of Working Capital Management on the Profitability of quoted Industrial Goods Firms in Nigeria. Four independent objectives and four supporting hypotheses were stated and formulated respectively. The study covers a period of eight (8) years from 2009 to 2016 and a total of 15 firms' data were used as other firms were filtered out from the 21 quoted Industrial Goods Firms.

In the second chapter of this study, several concepts touching both the explained and the explanatory variables were outlined and discussed; the following were specifically discussed; concepts of average receivables, concepts of average payables, concepts of inventory turnover, concepts of cash conversion cycle and that of profitability. Empirical studies were reviewed in respect of each independent variable with respect to the dependent variable. The chapter was concluded with a discussion on trade credit theory which is the underpinning theory on which working capital management is anchored.

In this study, correlational research design was adopted, the data was panel and multiple regression was employed in order to explain and make prediction of the relationship between working capital management and profitability of quoted Industrial Goods Firms in Nigeria. Furthermore, the correlation research design was used in estimating the association between the explanatory variables such as; Inventory Turnover (ITO), Account Receivable days (ARD), Account Payable days (APD) and Cash Conversion Cycle (CCC) and the explained variable

which is Returns on Asset (ROA). The model to be used was detailed out and the justification for using the model.

The data collected were analysed and there was evidence that data so collected were not normally distributed. Test for multicollinearity and robustness were also carried out and it was found that there is no harmful multicollinearity and the data were well fitted for the study. The study provides evidence of positive and significant relationship between Average Receivables and Firm Profitability (ROA) of Industrial Goods Firms listed in Nigeria. Furthermore, Average Payables and Average Inventory Turnover was found to be negatively influencing Profitability of Industrial Goods Firms listed in Nigeria. While Inventory Turnover was negatively significant, Accounts Payable days was found to be negative but not significant at all levels of significance (1%, 5% & 10%). Finally a positively significant statistical relationship was found to exist between Cash Conversion Cycle (CCC) and Profitability (ROA) of Industrial Goods Firms listed in Nigeria.

## **5.2 Conclusions**

In line with the discussion and analysis from chapter four (4) of the study, the study concludes as follows:

There is a significant relationship between Profitability (ROA) and Working Capital Management in the Industrial Goods Firms in Nigeria as represented by Account Receivable Days (ARD), Account Payable Days (APD), Inventory Turnover Days (ITO) and Cash Conversion Circle (CCC). Though Inventory Turnover Days (ITO) were found to be Negatively Significant, Account Receivable Days and Cash Conversion Cycle were found to be Positively

Significant. However, the same cannot be said of Accounts Payable for it was not significant at either 1%, 5% or 10% levels of Significance.

### **5.3 Recommendations**

In line with the findings and conclusions of this study, the following recommendations are hereby proffered:

- The account receivable days should be reduced to eight (8) days or maintained at the existing average of thirty one (31) days by the management of industrial goods firms in order to increase the profitability of the companies. This is because reducing account receivables days may enhance firm profitability position (Deloof, 2003).
- The management of industrial goods firms should increase the payable number of days to a maximum of fifty six (56) days or an average of twenty nine (29) days in order to payback for the goods or raw materials supplied to them by the suppliers for enhanced profitability position. Exceeding the maximum expected payable days will make the firm to loss its credit rating thereby losing its trade credit financing opportunities.
- The management of industrial goods firms should not hold inventory for more than seventy four (74) days but can hold inventory for an average of eight (8) days. Stocks that are kept beyond 74 days have associated holding cost, carrying cost, pilferage exposure and obsolesce cost that tends to wipe out the expected profit position of the firm, thereby exposing the firm to the margin of negative performance instead of an expected positive

return on assets (ROA). In addition, unnecessary inventory holding is known to tie down firm's working capital and therefore, affect the firm's day to day operations which may have a negative effect on the firm's profitability.

- It is also recommended that the management of industrial goods firms should reduce the cash conversion cycle period by employing just-in-time (JIT) technique in order to avoid unnecessary holding cost and obsolesce and consequently increase the profit of the company.

#### **5.4 Limitations of the Study**

The findings of this study and recommendations made on Working Capital Management is only applicable to the Industrial Goods Firms in Nigeria, other sectors of the manufacturing companies may not rely on this recommendations. Also other aspects of the variables that relates to working capital management such as trading circle variables, current ratio, current liability to total asset and non-listed companies that are directly or indirectly affected by working capital are not included, which should be seen as limitation of the study. However, the limitation can be mitigated by extrapolating the results of this work beyond its limiting boundaries.

#### **5.5 Suggestion for Future Research**

The topic on working capital management cannot be exhaustively dealt with under one study because the variables are extensively large. Similarly, considering only one sector (industrial goods firms) under manufacturing, the finding may not be used to generalize for the whole sector, as such, we would like to make the following suggestions.

- i. Since the scope of this work covered only listed Industrial Goods Firms in Nigeria, study on other sectors should be carried out to replicate the findings of the Industrial Goods sectors of manufacturing or counter the findings.
- ii. The study did not make use of all working capital management variables so also are other firm performance indicators not used, therefore, there is the need to carry out a study using such other variables.
- iii. Future research could expand the scope of the study by increasing the sample size and number of performance indicators, also the research need not be limited to quoted companies only, medium and small scale Industries can also be incorporated in future studies.

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## APPENDIX

```
. correlate roa ar ap inv ccc fs
(obs=104)
```

	roa	ar	ap	inv	ccc	fs
roa	1.0000					
ar	0.5369	1.0000				
ap	-0.0991	-0.3160	1.0000			
inv	-0.0756	0.1819	-0.3276	1.0000		
ccc	0.1464	0.1548	0.1450	0.3257	1.0000	
fs	-0.1505	-0.1546	0.1499	-0.2878	0.1085	1.0000

```
. reg roa ar ap inv ccc fs
```

Source	SS	df	MS	Number of obs =	104
Model	4962276.83	5	992455.366	F( 5, 98) =	10.97
Residual	8867369.58	98	90483.363	Prob > F =	0.0000
				R-squared =	0.3588
				Adj R-squared =	0.3261
Total	13829646.4	103	134268.412	Root MSE =	300.8

roa	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
ar	-11.87552	39.92611	-0.30	0.767	-91.1076	67.35655
ap	89.14817	14.93229	5.97	0.000	59.51553	118.7808
inv	-297.0955	101.8771	-2.92	0.004	-499.2673	-94.92368
ccc	44.0434	22.81987	1.93	0.056	-1.241898	89.3287
fs	-240.8686	126.1055	-1.91	0.059	-491.1209	9.383724
_cons	-432.6065	310.5895	-1.39	0.167	-1048.961	183.7482

```
. vif
```

Variable	VIF	1/VIF
inv	1.49	0.672883
ap	1.36	0.736157
ccc	1.34	0.745955
ar	1.19	0.841267
fs	1.17	0.853396
Mean VIF	1.31	

```
. hettest
```

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of roa

chi2(1) = 453.72

Prob > chi2 = 0.0000

```
. xtreg roa ar ap inv ccc fs,fe
Fixed-effects (within) regression      Number of obs   =    104
Group variable: year                  Number of groups =     11
R-sq:  within = 0.3877                Obs per group:  min =     9
      between = 0.2556                    avg =    9.5
      overall = 0.3544                    max =    10
corr(u_i, Xb) = -0.2454                F(5,88)         =   11.14
                                      Prob > F         =   0.0000
```

roa	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
ar	-32.93461	43.09801	-0.76	0.447	-118.5829	52.71363
ap	93.72902	15.30486	6.12	0.000	63.31384	124.1442
inv	-336.6845	107.5689	-3.13	0.002	-550.455	-122.9139
ccc	66.84312	25.33989	2.64	0.010	16.48541	117.2008
fs	-277.1626	128.3032	-2.16	0.033	-532.1382	-22.18702
_cons	-724.2629	336.6407	-2.15	0.034	-1393.265	-55.26026
sigma_u	115.54373					
sigma_e	296.51236					
rho	.13182939	(fraction of variance due to u_i)				

F test that all u\_i=0: F(10, 88) = 1.29 Prob > F = 0.2509

```
. xtreg roa ar ap inv ccc fs,re
Random-effects GLS regression        Number of obs   =    104
Group variable: year                Number of groups =     11
R-sq:  within = 0.3828                Obs per group:  min =     9
      between = 0.2836                    avg =    9.5
      overall = 0.3588                    max =    10
corr(u_i, X) = 0 (assumed)           Wald chi2(5)    =   54.84
                                      Prob > chi2     =   0.0000
```

roa	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
ar	-11.87552	39.92611	-0.30	0.766	-90.12927	66.37822
ap	89.14817	14.93229	5.97	0.000	59.88142	118.4149
inv	-297.0955	101.8771	-2.92	0.004	-496.771	-97.42002
ccc	44.0434	22.81987	1.93	0.054	-.6827322	88.76953
fs	-240.8686	126.1055	-1.91	0.056	-488.0308	6.293701
_cons	-432.6065	310.5895	-1.39	0.164	-1041.351	176.1377
sigma_u	0					
sigma_e	296.51236					
rho	0	(fraction of variance due to u_i)				

```
. hausman fe re
```

	Coefficients			
	(b) fe	(B) re	(b-B) Difference	sqrt(diag(v_b-v_B)) S.E.
ar	93.72902	89.14817	4.580852	3.356394
ap	-32.93461	-11.87552	-21.05909	16.22788
inv	-336.6845	-297.0955	-39.58896	34.52707
ccc	66.84312	44.0434	22.79972	11.01651
fs	-277.1626	-240.8686	-36.29407	23.64541

b = consistent under Ho and Ha; obtained from xtreg  
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(5) = (b-B)'[(v\_b-v\_B)^(-1)](b-B)  
 = 1.46  
 Prob>chi2 = 0.9179  
 (v\_b-v\_B is not positive definite)

. xttest0

Breusch and Pagan Lagrangian multiplier test for random effects

$$roa[year,t] = \alpha + u[year] + e[year,t]$$

Estimated results:

	Var	sd = sqrt(Var)
roa	134268.4	366.4265
e	87919.58	296.5124
u	0	0

Test: Var(u) = 0

chibar2(01) = 0.00  
 Prob > chibar2 = 1.0000

. sum roa ar ap inv ccc fs

Variable	Obs	Mean	Std. Dev.	Min	Max
roa	104	5.269856	8.197877	-12.9631	45.13098
ar	104	3.146552	.9508836	.8678861	4.895925
ap	104	2.967361	1.214121	1.001316	5.573143
inv	104	.7741527	.9861107	.039427	7.374495
ccc	104	2.911197	1.26525	.2191326	4.895925
fs	104	.2312203	.2544229	-.0140006	1.013704

ROA

Percentiles	Smallest		
1%	.0243143	-12.9631	
5%	.1204883	.0243143	
10%	.3743201	.0629789	Obs 104
25%	1.117856	.0675846	Sum of wgt. 104
50%	2.49118		Mean 5.269856
		Largest	Std. Dev. 8.197877
75%	5.10482	27.5215	
90%	13.43839	29.25276	Variance 67.20519
95%	24.58981	37.12739	Skewness 2.497439
99%	37.12739	45.13098	Kurtosis 10.41736

AR

Percentiles	Smallest		
1%	1.155387	.8678861	
5%	1.97945	1.155387	
10%	2.045913	1.213826	Obs 104
25%	2.316289	1.525878	Sum of wgt. 104
50%	3.026734		Mean 3.146552
		Largest	Std. Dev. .9508836
75%	3.933139	4.854389	
90%	4.430009	4.88304	Variance .9041797
95%	4.783778	4.895832	Skewness .0147116
99%	4.895832	4.895925	Kurtosis 2.184866

AP

Percentiles	Smallest		
1%	1.005074	1.001316	
5%	1.065616	1.005074	
10%	1.32599	1.006876	Obs 104
25%	2.038435	1.033629	Sum of wgt. 104
50%	3.023802		Mean 2.967361
		Largest	Std. Dev. 1.214121
75%	4.010991	5.166497	
90%	5.005459	5.232067	Variance 1.47409
95%	5.042022	5.237596	Skewness .2258239
99%	5.237596	5.573143	Kurtosis 2.192612

INV

Percentiles		Smallest		
1%	.0542914	.039427		
5%	.17329	.0542914		
10%	.220055	.0616425	Obs	104
25%	.2993697	.0878311	Sum of wgt.	104
50%	.447559		Mean	.7741527
		Largest	Std. Dev.	.9861107
75%	.850791	3.130455		
90%	1.53645	4.094287	Variance	.9724143
95%	2.110971	4.104535	Skewness	3.958235
99%	4.104535	7.374495	Kurtosis	22.96132

CCC

Percentiles		Smallest		
1%	.2411204	.2191326		
5%	.3273711	.2411204		
10%	.5145231	.2677014	Obs	104
25%	2.141286	.2792442	Sum of wgt.	104
50%	3.005347		Mean	2.911197
		Largest	Std. Dev.	1.26525
75%	3.930545	4.854389		
90%	4.430009	4.88304	Variance	1.600857
95%	4.783778	4.895832	Skewness	-.5562922
99%	4.895832	4.895925	Kurtosis	2.639912

FS

Percentiles		Smallest		
1%	-.0140006	-.0140006		
5%	.0006157	-.0140006		
10%	.0048811	.0006157	Obs	104
25%	.027832	.0006157	Sum of wgt.	104
50%	.1018481		Mean	.2312203
		Largest	Std. Dev.	.2544229
75%	.4326278	.8022785		
90%	.5897972	.8042346	Variance	.064731
95%	.741752	.9061103	Skewness	1.042209
99%	.9061103	1.013704	Kurtosis	3.035629

Shapiro-wilk w test for normal data

Variable	Obs	W	V	z	Prob>z
roa	104	0.09436	77.265	9.664	0.00000
ar	104	0.96805	2.726	2.229	0.01290
ap	104	0.96006	3.407	2.725	0.00321
inv	104	0.57154	36.554	8.001	0.00000
ccc	104	0.94136	5.003	3.579	0.00017
fs	104	0.83215	14.321	5.917	0.00000

**LIST OF POPULATION AND SAMPLE (INDUSTRIAL GOODS)**

<b>S/NO</b>	<b>COMPANY NAME</b>	<b>LISTING DATE</b>	
1	ADSWITCH PLC	1991	SELECTED
2	AFRICAN PAINTS (NIGERIA) PLC.	1996	SELECTED
3	ASHAKA CEM PLC	1990	SELECTED
4	AUSTIN LAZ & COMPANY PLC	2007	
5	AVON CROWNCAPS & CONTAINERS	1994	SELECTED
6	BERGER PAINTS PLC	1974	SELECTED
7	BETA GLASS CO PLC.	1986	SELECTED
8	CAP PLC	1978	SELECTED
9	CEMENT CO. OF NORTH.NIG. PLC	1993	SELECTED
10	CUTIX PLC.	1987	SELECTED
11	DANGOTE CEMENT PLC	2008	
12	DN MEYER PLC.	1979	SELECTED
13	FIRST ALUMINIUM NIGERIA PLC	1992	SELECTED
14	IPWA PLC	1978	SELECTED
15	LAFARGE AFRICA PLC.	1979	SELECTED
16	NIGERIAN ROPES PLC	1978	SELECTED
17	PAINTS AND COATINGS MANUFACTURES PLC	2008	
18	PORTLAND PAINTS & PRODUCTS NIGERIA PLC	2009	

19	PREMIER PAINTS PLC.	1995	SELECTED
20	W A GLASS IND. PLC.	1985	SELECTED