WORKING CAPITAL MANAGEMENT AND PROFITABILITY OF LISTED PHARMACEUTICAL FIRMS IN NIGERIA.

BY

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M.SC /ADMIN/ 1017/2010-2011

BEING A THESIS SUBMITTED TO THE SCHOOL OF POSTGRADUATE STUDIES, AHMADU BELLO UNIVERSITY ZARIA, IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF SCIENCE (M.Sc) DEGREE IN ACCOUNTING AND FINANCE

DEPARTMENT OF ACCOUNTING
FACULTY OF ADMINISTRATION
AHMADU BELLO UNIVERSITY, ZARIA

JULY, 2014

DECLARATION

I declare that this M. Sc. Thesis entitled "Working Capital Management and Profitability of Listed Pharmaceutical Firms in Nigeria" has been carried out by me in the department of accounting. The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this thesis was previously presented for another degree or diploma at this or any other institution.

_____ _____

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CERTIFICATION

This Thesis entitled "Working Capital Management and Profitability of Listed Pharmaceutical Firms in Nigeria" by OJEANI, Nneka Roseline meets the regulations governing the award of the degree of Master of Science in Accounting and Finance of Ahmadu Bello University, Zaria and is approved for its contribution to knowledge and literary presentation.

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DEDICATION

This M. Sc. Thesis is dedicated to God Almighty for his strength, to my Daughter Lynette Favor Joseph, to my Mother and my Siblings, for their care and support.

ACKNOWLEDGEMENTS

The completion of this M. Sc. Research process would not have been possible without the contributions of many different people. I would like in this section to extend my appreciation especially to my supervisors. First and foremost, I offer my sincerest gratitude to the Chairman Supervisory Committee, Dr. Shehu Usman Hassan, who has supported me in all aspects of this research, with his patience, knowledge, encouragement and constructive criticisms which brought the work to its present state. Similarly, my sincere appreciation to the Member of the Supervisory Committee, Mr. Luka Mailafia for his suggestions, and numerous contributions that improve the work in many ways.

I wish to express my profound gratitude to Dr. Sabari who encouraged me to continue on this work, and my Head of Department Dr. Ahmad Bello Dogarawa, the M.sc Cordinator Dr. Salisu Abubakar for their encouragement and all the lecturers in Accounting Department who has helped in one way or the other in making this work a success.

My gratitude also goes to All my classmates especially Mr. Jimoh Ihiovi, all my colleagues in the office Eco bank Nigeria NDA branch for their help in ensuring that this work is successful.

My hearty expression goes to my lovely daughter Lynette Favor Joseph and to my Mother and siblings for their support, prayers and encouragement throughout the duration of this work.

I mostly give thanks to Almighty God for his strength and for keeping me alive to see the conclusion of this successful journey.

ABSTRACT

Working capital managemt involves the management of the most liquid resources of the firm which includes cash and cash equivalents, inventories, trade debtors and other receivables. Most firms do not ensure optimal level of working capital and this has been a major obstacle to their overall profitabilty. The study examined the impact of working capital management on the profitability of Pharmaceutical firms listed on the Nigerian Stock Exchange market. Correlation and ex-post facto research design were used in a sample of 5 Pharmaceutical firms. Secondary data for a period of 10 years (2002-2011) was used, and Ordinary Least Squares (OLS) multiple regression was employed in data analysis. The study found that working capital management (account receivables collection management, accounts payables management, inventory management, cash conversion cycle management, operating cash flow management) has a significant impact on the profitability of listed pharmaceutical firms in Nigeria. It is therefore recommended among others that managers should focus on reducing inventory days, collect receivable as soon as possible because it is better to recieve inflows sooner than later, and delay payment of creditors inorder to invest the money in short-term securities which are profitable. Also, the cash conversion cycle should be elongated to the extent that it maximizes profit.

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CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The economic theory of firm requires that firm resources should be utilized efficiently in order to achieve economic successes. Moreover, the competitive modern business environment makes financial managers irrespective of the nature of their business to ensure efficient utilization of firm resources. Firm resources are broadly classified into two, long-term assets (non-current assets) and short-term assets (current assets). Therefore, there are two major decisions in the theory of corporate financial management, that is, the long-term or capital budgeting decision and the short-term or working capital management decision (Pandey, 2009). Although long-term capital decisions are of critical importance to the going-concern of a firm, workings capital management has direct consequences on the liquidity position and the ultimate profitability of a firm (Burt & Abbate, 2009).

Working capital connotes the funds lock up in materials, work in progress, finished goods, receivables and cash. In this regard, Khan and Jain, (2005) state that current assets are those assets, which can be converted into cash within a short period of time, and the cash received is again invested into these assets; hence, it is constantly receiving or circulating. Therefore, working capital is one of the most important measurements of the financial position, which according to Guthmann (2008) is the life-blood and nerve centre of any business entity. This necessitated the need for the careful management of working capital in every business organization with the value maximization objective.

Therefore, working capital management involves the application of strategies and policies in the use of firm's current assets and liabilities in such a way that an optimum level of working capital is maintained. In essence, the goal of working capital management is to promote a satisfying profitability and maximizes shareholders' value (Li & Han-Wen, 2006). They

further lament that profitability is affected by the choices that companies make regarding their working capital policies. Thus, if a firm cannot maintain an optimum level of working capital, it is likely to become insolvent and may even be forced into bankruptcy. However, the need for working capital to run day-to-day business activities effectively cannot be overemphasized.

In essence, managing working capital is necessary because of its' directs effects on the profitability and liquidity of a corporate entity. Rehn (2012) asserts that working capital usually refer to net working capital, the difference between current assets and current liabilities. Thus, it involves minimizing the timing of collecting receivables, deferring the period of payables, and keeping the minimal inventory. Moreover, working capital management includes cash management, that is, how to invest idle cash without compromising liquidity.

Consequently, extant literature on firm profitability and efficiency documents different resulting effect of sub-optimal working capital management on performance and value of firm (Deloof, 2003). According to him, efficient working capital have many effects, which include speeds payment of short-term commitments on firms; facilitating owner financing and it reduces working capital as a cause of firms' failure. In addition, Osisioma, (1997) and Wignaraja and O'Neil (1999) revealed that working capital ensures a sound liquidity for assurance of long-term economic growth and attainment of profit generating process, and also ensures acceptable relationship between the components of firms' working capital for efficient mix which guarantee capital adequacy. On the contrary, Peel and Wilson (1996), Shin and Soenen (1998), Eljielly (2004) and Appuhami (2008) are of the view that inefficient working capital induces firms' failures, overtrading signs, inability to propel firm liquidity and profitability, and loss of business due to scarcity of products.

However, optimal efficient working capital management is usually achieved through the management of receivables, payables, inventory, cash conversion cycle and the operating cycle as a whole. In this regards, Van Horne (1995) laments that accounts receivables management involves achieving an optimal average time taken by credit customers to settle their accounts. Moreover, since the purpose of offering credit is to maximise profitability, the costs of debt collection should not be allowed to exceed the amounts recovered. Accounts or trade payables management focuses on the average time taken by a company to pay its trade payables (suppliers); it the current liabilities and all obligations, which mature within a year such as creditors, bills payable, accrued expenses, short-term bank loan, income tax liability and long-term debt excluding bank overdraft, all of which quickly mature in the current year (Uyar, 2009).

Moreover, accounts payables management is used to know how much credit time received by the firm from its trade creditors; it therefore shows the breathing time received by the firm in terms of payment of credit purchase. Hence, the effectiveness lies in whether the firm is enjoying the actual credit period promised by suppliers. Cash conversion cycle according to Wang (2002) is used in measuring cash management, and it represents the interaction between the components of working capital and the flow of cash within a company. Similarly, it can also be used to determine the amount of cash needed for any sales level; it is therefore a period of time between the outlay of cash on raw materials and the inflow of cash from the sale of finished goods.

Inventory management according to Stephen (2012) especially in a manufacturing firm consist of three components: raw material, work in progress and finished goods. He further explain that the holding of excessive stocks will lead to tied up capital in stocks while the holding of inadequate stock may lead to stock out costs such as lost profitability and goodwill from customers. A firm therefore needs to set an optimal level of stock to hold. To set the

optimal amount of stock to hold and order, the Economic Order Quantity (E.O.Q) is usually used (Erlenkotter, 1990).

In view of the foregoing discussions, working capital management is considered as a very sensitive area in the field of financial management (Joshi, 1994); because it involves the decision of the amount and composition of current assets and the financing of these assets. Moreover, the decisions with regards the level of different working capital components become frequent, repetitive, and time consuming. However, most firms do not hold the correct amount of working capital and this has been a major obstacle to their overall profitability (Stephen, 2012). This together with the current liquidity crisis has highlighted the significance of working capital management. Because management of working capital has profitability and liquidity implications, which requires the firm manager to reach optimal working capital by controlling the trade-off between profitability maximization and liquidity accurately (Raheman & Mohamed, 2007).

This study is motivated by the recent global financial crises which significantly affect the liquidity position and the overall business activities across the world. In Nigeria, where credit is either not available or expensive to obtain, there are corporate issues across almost all the firms that, has to do with liquidity problem and consequently their operating performance. Financial managers are always expected when there is a liquidity problem, to examine the current assets and current liabilities in order to make an informed decision with regard the profitability of their entity. In the same vein, researchers do conduct studies to examine the relationships among the firms' working capital components and profitability using different methodologies.

Therefore, this study focuses on pharmaceutical companies in Nigeria; the pharmaceutical industry manufactures and distributes drugs and medical equipment to the Nigerian populace. Nigeria as an African nation with over 140 million citizens is known with high demand of

drugs and adequate health care services to address medical problems. Despite the high demand of pharmaceutical business in Nigeria, the market is described as one of the smallest among Middle and East African (MEA) region (Lead Capital Limited, 2008). With the exception of a few globally recognized brands, many of the pharmaceutical companies and health care providers in Nigeria cannot adequately compete internationally (Lead Capital Limited, 2008). However, several effects particularly from foreign agencies and governments are in place to improve the pharmaceutical industry in Nigeria.

However, it is necessary and logical to carry out a study on the performance in relation to the management of working capital of the Nigerian pharmaceutical companies. The rationale is to provide empirical evidences as to the effectiveness of the financial management of the pharmaceutical firms, in line with the effort of improving the sector. It is against this background that this study attempt to assess the impact of working capital management and the profitability of listed pharmaceutical firms in Nigeria.

1.2 Statement of the Problem

One of the major objectives of working capital management is to ensure that corporate entities have sufficient, regular and consistent cash flow to fund their activities. Therefore, efficient working capital management could enable firms in sustaining growth which, in turn leads to strong liquidity and profitability for ensuring effective and efficient customer services. As such efficient management of working capital is very vital for a business survival.

For instance, too much capital signifies inefficiency where as too little cash in hand signifies that the survival of the business is shaky. Stephen (2012) documents evidence that most business organizations do not hold the right amount of stocks, debtors and cash; as a result of which the firms are unable to meet there maturing short term obligations and its upcoming

operational needs. Similarly, insufficient working capital means that a firm is unable to undertake expansion projects and increase its sales, therefore limiting the growth and profitability of the business. These are particularly the symptoms revealed by the Nigerian pharmaceutical firms in the recent times, as majority of listed pharmaceutical firms in Nigeria have exhibited dwindling returns as well as poor stock performance.

Specifically, according to Lead capital limited, (2008) drug manufactures in Nigeria are faced with several constraints, including low capacity utilization, under capitalization, a weak financial base, high production costs as a result of the high cost of inputs and unstable demand among others. While efforts have been made by previous researchers to proper solutions to these issues, little has been made to investigate the short-term liquidity problems with respect to working capital management. Moreover, the extent to which working capital management affects profitability of these firms is not adequately researched, this constitute the problem of this study. And, this also led to the research question on how does the management of working capital components impacted the profitability of listed pharmaceutical firms in Nigeria?

However, working capital management has been empirically examine in many different ways, while some authors studied the impact of an optimal inventory management; others have studied the optimal way of managing accounts receivables that leads to profit maximization (Lazaridis & Tryfonidis, 2006; Besley & Meyer, 1987). Other studies have focused on how reduction of working capital improves a firm's profitability (Shin & Soenen, 1998; Deloof, 2008; Raheman & Nasr, 2007; Samiloglu, 2008; Zariyawati, 2009; Falope & Ajilore, 2009; Dong & Su, 2010; Sharma & Kumar, 2011. In summary, most of these studies concentrated on a single working capital component and the study are mostly from the developed economy, where the market mechanisms and the business environment significantly differ from Nigeria. This provided a gap for this study to fill.

Similarly, this study used all the working capital components and examines their effect on the profitability using a multiple linear regression model. This also differentiates this study from the previous studies in the field of working capital management and firm performance.

1.3 Objectives of the study

The main objective of the study is to examine the impact of working capital management on the profitability of listed pharmaceutical firms in Nigeria. Other specific objectives are:

i. To investigate the impact of receivables collection management on the profitability of listed pharmaceutical firms in Nigeria

ii. To examine the impact of inventory management on the profitability of listed pharmaceutical firms in Nigeria.

iii. To determine the effect of accounts payable management on the profitability of the listed pharmaceutical firms in Nigeria.

iv. To identify the impact of cash conversion circle on the profitability of listed pharmaceutical firms in Nigeria.

v. To determine the impact of operating cash flow on the profitability of listed pharmaceutical firms in Nigeria.

vi. To determine the impact cash ratio on the profitability of listed pharmaceutical firms in Nigeria.

1.4 Research Hypotheses

In line with the objectives of the study, the following hypotheses have been formulated:

H_{01}: Receivables collection management has no significant impact on the profitability of the listed pharmaceutical firms in Nigeria.

H_{02}: Accounts payable management has no significant impact on the profitability of listed pharmaceutical firms in Nigeria.

H_{03}: Inventory management has no significant impact on the profitability of listed pharmaceutical firms in Nigeria.

H_{04}: Cash conversion circle has no significant impact on the profitability of listed pharmaceutical firms in Nigeria.

H_{05}: Operating cash flow has no significant impact on the profitability of listed pharmaceutical firms in Nigeria.

H_{06}: Cash ratio has no significant impact on the profitability of listed pharmaceutical firms in Nigeria.

1.5 Scope of the Study

This study aims to evaluate the impact of working capital management and its main components on the profitability of the listed pharmaceutical firms in Nigeria. The study is restricted to all pharmaceutical firms listed on the Nigerian Stock Exchange (NSE) market during the period 2002 to 2011. The study limits itself to the information in the annual report and accounts of listed pharmaceutical firms for the period under review.

The dependent variable of the study is profitability, defined as the gross operating profit; and the independent variable is working capital management measured by account payables management, cash conversion cycle, account receivables management, inventory management, and cash management (cash to sales ratio and cash to current liability ratio). The study covers the period of ten (10) years (2002-2011).

1.6 Significance of the Study

The critical role working capital management is playing in the short-term liquidity position and the recent crises of credit and liquidity make this study a necessity. Therefore, this study is significant in revealing the effect of working capital management on the profitability of pharmaceutical firms listed on the floor of Nigeria Stock Exchange. The study's findings may help the pharmaceutical firms in Nigeria and other companies in general improve on their financial decision making so as to optimize the value of the shareholders and maintain a favorable trade-off between liquidity and profitability. The findings are also expected to be useful to Shareholders (as owners), Creditors, Managers, and Researchers.

Shareholders as the business owners could be the primary beneficiaries of the findings from this research, as anything affecting the value of their investments is of great importance to them. Working capital management has the potentials of improving profitability and the overall firm value in general; this study is design to find out the impact of the individual working capital components on the profitability of pharmaceutical firms in Nigeria. Thus, the shareholders of the pharmaceutical firms will benefit from the findings of the study.

Managers of the listed pharmaceutical firms in Nigeria are also among the main beneficiaries of the finding of this research. This is because managers are usually interested in understanding the effects of their performance on the profitability and firm value. Hence, this study is an attempt towards such direction. Moreover, managers will like to know the stability of their firms' liquidity position, particularly under unfavourable economic conditions. On the other hand, the findings will enable businesses to measure the level of safety in being able to discharge obligations in order to attain profitability and to be prepared for unforseen events by providing cushion for such occurences.

This study could also be of significant importance to creditors, because they are interested in the credit worthiness of the firms in meeting their obligations, which could only be possible

with efficient management of firm's working capital. The study could be of interest to the business community in particular and to the government of Nigeria whose concern is to promote economic growth of the country through creation of an environment that is conducive for business.

Lastly, students and researchers could find this study useful in that they are interested in how theoretically related variables empirically affect each other. This study is in the same direction, and it will also serve as sources of knowledge for the student and a point of references for researchers.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

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

2.2 Conceptual Issues

In this section, conceptual issues relating to working capital, working capital management, objectives of working capital management, working capital management policies, working capital management in developing economies and profitability are discussed and presented.

2.2.1 Concept of Working Capital

Khan and Jain (2005) defined working capital as the funds locked up in materials, work in progress, finished goods, receivables, and cash and cash equivalent. Thus, they defined working capital as capital invested in current assets, which are those assets that can be converted into cash within a short period of time and the cash received is again invested into the assets. In the words of Van Horne and Wachowicz (2004) Working Capital represents the amount of current assets that have not been supplied by current, short term creditors. In the same vein Chandra (2006) sees Working Capital as the excess of current assets that has been supplied by the long-term creditors and the stockholders.

However, working capital is divided into Gross and net; Gross working capital refers to the amount of funds invested in current assets that are employed in the business process while, Net Working Capital refers to the difference between current assets and current liabilities (Khan & Jain, 2005). Moreover, Current assets and liabilities, that is, assets and liabilities with maturities of less than one year, need to be carefully managed. Net working capital is the term given to the difference between current assets and current liabilities: current assets may include inventories of raw materials, work-in-progress and finished goods, trade receivables, short-term investments and cash, while current liabilities may include trade payables, overdrafts and short-term loans. The level of current assets is a key factor in a company's liquidity position (Pass and Pike 1984). Working capital can be viewed dynamically as equilibrium between the income-generating and resource-purchasing activities of a company (Pass and Pike 1984), in which case it is closely linked to the cash conversion cycle.

According to Pass and Pike (1984) Gross working capital (Total Current Assets) refers to the firm's investment in current assets. Current assets are the assets, which can be converted into cash within an accounting year or operating cycle. Thus, Gross working capital, is the total of all current assets. Net working capital according to them refers to the difference between current assets and current liabilities. Current liabilities are those claims of outsiders, which are expected to mature for payment within an accounting year. Net working capital may be positive or negative. A positive net working capital will arise when current assets exceed current liabilities and a negative net working capital will arise when current liabilities exceed current assets i.e. there is no working capital, but there is a working capital deficit. It includes Therefore, the two concepts of working capital, gross working capital and net working capital are exclusive; both are equally important for the efficient management of working capital (Van Horne, 1995). The gross working capital focuses attention on two aspects how to

optimize investment in current assets? And how should current assets is financed? While, net working capital concept is qualitative. It indicates the Liquidity position of the firm and suggests the extent to which working capital needs may be financed by permanent sources of funds (Van Horne, 1995).

In this the concept of working capital refers to both gross and net working capital, as the study covers accounts receivables and payables, inventory and cash.

2.2.1.1 Working Capital Components

According to Van Horne and Wachowicz (2004) the necessary components of an organization's working capital, basically, depend on the type of business and industry. They further narrate that Cash, debtors, receivables, inventories, marketable securities, and redeemable futures can be recognized as the common components of organization's working capital. However, the question is to recognize the factors that determine the adequacy of working capital based on growth, size, operating cash flow, etc. The inability to understand the determining factors and measurement of adequate amounts of working capital will lead an organization to bankruptcy.

Van Horne, (1995) provides the analysis of the components of gross working capital, which is the current assets, which can be converted into cash within an accounting year or operating cycle. Thus, Gross working capital, is the total of all current assets and includes; Inventories (Raw materials and Components, Work-in-Progress, Finished Goods, Others); Trade Debtors; Loans and Advance; Cash and Bank Balances; Bills Receivables; and Short-term Investment.

On the other hand, Net Working Capital refers to the difference between current assets and current liabilities; where current liabilities are those claims of outsiders, which are expected to mature for payment within an accounting year (Deloof, 2003). According to him, Net working capital may be positive or negative. A positive net working capital will arise when

current assets exceed current liabilities and a negative net working capital will arise when current liabilities exceed current assets i.e. there is no working capital, but there is a working capital deficit. It includes; Trade Creditors; Bills Payable; Accrued or Outstanding Expenses; Trade Advances; Short Term Borrowings (Commercial Banks and Others); Provisions; and Bank Overdraft.

2.2.2 Concept of Working Capital Management

Van Horne (1995) defined working capital management as the administration of current assets in the name of cash, marketable securities, receivables and staff advances, and inventories. Osisioma (1997) demonstrated that good working capital management must ensure an acceptable relationship between the different components of a firm's working capital so as to make an efficient mix, which will guarantee capital adequacy. Therefore, working capital management should make sure that the desirable quantities of each component of the working capital are available for management.

Working capital management is defined by Brigham, et al. (1999) as the management of the investment in current assets and the financing of the current assets, and involves setting working capital management policy and carrying out that policy in a business's daily operations, to achieves its goals and objectives, such as shareholder wealth maximization, Competitive advantage, and growth. Working capital management in view of Paulo (1992) based on purpose of working capital ensures the effective and efficient utilization of the business's investment in fixed assets. According to Brigham, et al. (1999), and Cooper, et al. (1998) if performance criteria such as liquidity, solvency/ bankruptcy, efficiency, profitability and Economic Value Added are considered, it will be clearly apparent that the business must hold and manage the different levels of working capital which are appropriate to its performance criteria.

Vineet and Sukhdev (2013) see working capital management from efficiency perspective and can be measured and achieved through the cash conversion efficiency, days operating cycle and days working capital. Therefore, this study considers working capital management as the efficient administration of the working capital components in such a manner that a trade-off is achieved between liquidity and profitability and the firm value is improved.

2.2.2.1 Objectives of Working Capital Management

One of the modern systems of corporate governance is management by objective that is all the organizational activities should be focused on the firm objectives. However, to be effective, working capital management requires a clear specification of the objectives to be achieved. The two main objectives of working capital management are to increase the profitability of a company and to ensure that it has sufficient liquidity to meet short-term obligations as they fall due and so continue in business (Pass and Pike 1984). Profitability is related to the goal of shareholder wealth maximisation, so investment in current assets should be made only if an acceptable return is obtained.

Van Horne (1995) assert that while liquidity is needed for a company to continue in business, a company may choose to hold more cash than is needed for operational or transaction needs, for example for precautionary or speculative reasons. The twin goals of profitability and liquidity will often conflict since liquid assets give the lowest returns. Cash kept in a safe will not generate a return, for example, while a six-month bank deposit will earn interest in exchange for loss of access for the six-month period.

2.2.2.2 Management of Working Capital Components

The basic working capital components which should be managed efficiently includes the account receivables or debtors collection period, accounts payables or creditors payment period, inventory management, cash and cash equivalents and the operating cycle of a firm.

Accounts Receivables Management: This constitutes that management of firms' debtors. Accounts receivables period is the average time taken by credit customers to settle their accounts. Van Horne (1995) states that, since the purpose of offering credit are to maximise profitability, the costs of debt collection should not be allowed to exceed the amounts recovered. More so, a company should prepare regularly aged trade receivables analysis and take steps to chase late payers. It is helpful to establish clear procedures for chasing late payers, to set out the circumstances under which credit control staff should send out reminders and initiate legal proceedings. Some thought could also be given to charging interest on overdue accounts to encourage timely payment, depending on the likely response of customers Van Horne and Wachowicz, (2004).

In working capital management, the receivables are a very important component of current assets and debtors collection period or receivables turnover in days is the average length of time required to convert the firm's receivables into cash (Raheman, Qayyum & AFza, 2011). They added that managerial efficiency in granting and controlling credit could be ascertained on the basis of receivables turnover in days. It would indicate the pattern of debtors on the basis of which liquidity of debtors could be ascertained. If the firm takes more time in collecting receivables, the profitability of the firm declines.

To make a sensible decision about whether to trade with a company or not, information about the business is needed. The risk of bad debts can be minimised if the creditworthiness of new customers is carefully assessed before credit is granted and if the creditworthiness of existing customers is reviewed on a regular basis. Relevant information can be obtained from a variety of sources. New customers can be asked to provide bank references to confirm their

financial standing, and trade references to indicate satisfactory conduct of business affairs (Padachi, 2006). Published information, such as the audited annual report and accounts of a prospective customer, may also provide a useful indication of creditworthiness. A company's own experience of similar companies will also be useful in forming a view on creditworthiness, as will the experience of other companies within a group.

For a fee, a report may be obtained from a credit reference agency, the credit report may include a company profile, recent accounts, financial ratios and industry comparisons, analysis of trading history, payment trends, types of borrowing, previous financial problems and a credit limit (Van Horne and Wachowicz, 2004). Bearing in mind the cost of assessing creditworthiness, the magnitude of likely regular sales could be used as a guide to determine the depth of the credit analysis.

Moreover, a company's credit management policy should help it maximise expected profits (Van Horne & Wachowicz, 2004). It will need to take into account its current and desired cash position, as well as its ability to satisfy expected demand. To put the credit management policy into effect successfully, managers and staff may need training or new staff may need to be recruited. Hence, the Key variables affecting the level of receivables will be the terms of sale prevailing in a company's area of business and the ability of the company to match and service comparable terms of sale. There is also a relationship between the level of receivables and a company's pricing policy: for example, it may choose to keep selling prices relatively high while offering attractive terms for early payment. The effectiveness of trade receivables follow-up procedures used will also influence the overall level of receivables and the likelihood of bad debts arising (Van Horne & Wachowicz, 2004).

The accounts receivables management policy formulated by senior managers should also take into account the administrative costs of debt collection, the ways in which the policy could be implemented effectively, and the costs and effects of easing credit (Van Horne &

Wachowicz, 2004). It should balance the benefits to be gained from offering credit to customers against the costs of doing so. Longer credit terms may increase turnover, but will also increase the risk of bad debts. The cost of increased bad debts and the cost of any additional working capital required should be less than the increased profits generated by the higher turnover. In order to operate its trade receivables policy, a company needs to set up a credit analysis system, a credit control system and a trade receivables collection system. Hence, accounts receivables management is measured by the accounts receivable turnover ratio.

The Accounts receivables Turnover ratio is also termed as Debtors speed ratio. It indicates the quickness in realization of sundry debtors (Padachi, 2006; Deloof, 2003). The main object of this ratio is to know how much credit time is allowed and capital blocked in debtors. Debtors' turnover ratio also shows the effectiveness in collection of debts due. Generally, higher ratio is the indication of efficient management of liquidity. However, a firm should maintain a balance between the debtors outstanding and the amount of interest incurred on the blocked funds. The account receivables collection period is computed by dividing account receivables by net sales multiplied by 365 days (Raheman, et al., 2011).

Accounts Payables Management: The accounts or trade payables deferral period is the average time taken by a company to pay its trade payables, i.e. its suppliers (Uyar, 2009). Current liabilities include all obligations, which mature within a year such as creditors, bills payable, accrued expenses, short-term bank loan, income tax liability and long-term debt excluding bank overdraft, all of which quickly mature in the current year.

Uyar, (2009) opined that, accounts payables or Creditors Turnover ratio is used to know how much credit time received by the firm from its trade creditors. Creditors' turnover ratio shows the breathing time received by the firm in terms of payment of credit purchase. Hence, the effectiveness lies in whether the firm is enjoying the actual credit period promised by

suppliers. It is calculated by dividing the amount of purchases by creditors. Here it has been assumed that all of the purchases have been made as credit purchases. The account payables period is computed by dividing account payables by net purchases multiplied by 365 days (Raheman, et al., 2011).

Inventory Management: Inventory turnover in days is another important component of working capital management which is also called as inventory conversion period (Raheman, et al., 2011). According to them it is the average time required to convert materials into finished goods and then to sell those goods. This variable helps in evaluating the efficiency in inventory management policy of the firm. If the firms take more time in selling inventory which means inventories are not getting convert into sales, will decrease the profitability of firm. Inventory Turnover in Days is calculated using inventory divided by the cost of sales multiplied by 365 days.

Cash Management: According to Van Horne (1995) there are three reasons why companies choose to hold cash. These are Transactions motive, precaution motive, and speculation motive. Transaction Motive, companies need a cash reserve in order to balance short-term cash inflows and outflows since these are not perfectly matched. This is called the transactions motive for holding cash, and the approximate size of the cash reserve can be estimated by forecasting cash inflows and outflows and by preparing cash budgets. In addition to the cash reserve held for day-to-day operational needs, cash may be built up to meet significant anticipated cash outflows, for example those arising from investment in a new project or the redemption of debt (Van Horne, 1995).

Precautionary motive, Van Horne (1995) states that, forecasts of future cash flows are subject to uncertainty and it is possible that a company will experience unexpected demands for cash. This gives rise to the precautionary motive for holding cash. Reserves held for precautionary reasons could be in the form of easily-realised short-term investments, which are discussed

below. Speculative motive, companies may build up cash reserves in order to take advantage of any attractive investment opportunities that may arise, for example in the takeover market (Van Horne, 1995). Such reserves are held for speculative reasons. If a company has significant speculative cash reserves for which it cannot see an advantageous use, it may choose to enhance shareholder value by returning them to shareholders, for example by means of a share repurchase scheme or a special cash dividend.

Cash Conversion Cycle: the cash conversion cycle is used in measuring cash management, and it represents the interaction between the components of working capital and the flow of cash within a company (Wang, 2002). Cash conversion cycle can also be used to determine the amount of cash needed for any sales level; it is the period of time between the outlay of cash on raw materials and the inflow of cash from the sale of finished goods, and represents the number of days of operation for which financing is needed.

Uyar, (2009) the longer the cash conversion cycle, the greater the amount of investment required in working capital. The length of the cash conversion cycle depends on the length of: the inventory conversion period; the trade receivables collection period; and the trade payables deferral period. The length of the cash conversion cycle (CCC) is given by:

CCC = Inventory days + Trade receivables days − Trade payables days

Cash management, which is part of the wider task of treasury management, is concerned with optimising the amount of cash available, maximising the interest earned by spare funds not required immediately and reducing losses caused by delays in the transmission of funds (Uyar, 2009). Holding cash to meet short-term needs incurs an opportunity cost equal to the return which could have been earned if the cash had been invested or put to productive use. However, reducing this opportunity cost by operating with small cash balances will increase the risk of being unable to meet debts as they fall due, so an optimum cash balance should be found (Uyar, 2009).

Days Operating Cycle: Days operating cycle measures the efficiency with which the firms manage their inventory and receivables; it is the sum of raw material cycle (in days), work in progress cycle (in days), finished goods cycle (in days) and receivables (conversion period, in days) (Vineet and Sukhdev, 2013). The lower the days operating cycle the better it is and it depicts that the firm is minimising its investment in working capital and accelerating its working capital ratio. Reduction in operating cycle shall unleash funds which can be alternatively deployed by the firm (Anand, 2001).

Days Working Capital: Days' working capital is the days operating cycle less trade creditors (accounts payables period, in days); it measures the liquidity risk of the firms (Vineet and Sukhdev, 2013). They further lament that, days working capital is a measure of the cash conversion cycle that gives insight about the underlying health of a business. It is a key metric because it measures the average number of days tied up in net working capital in the operating cycle. If day's working capital is trending upwards over time then it will have a negative financial impact on overall company profit.

Moss and Stine, (1993) and Cheatham, (1989) stated that, in order to ensure the business's financial performance, it has been argued that the cash conversion cycle should be reduced to the point where the business's operations are not hurt. Therefore the shorter the cash conversion cycle, the more efficient the internal operations of the business, (Gentry, et al.1990). By management streamlining and wringing cash out of the operating or working capital cycle, profitability increases, the need for external financing is reduced, and a cash crunch that may result in illiquidity and eventual bankruptcy is precluded (Chang, et al. 1995, Maness, 1994). Moreover, decreasing the cash conversion cycle improves the cash flow position of the business by providing the business with finanancial flexibility to adjust to changes in business activity (Moss & Stine, 1993, and Schilling, 1996)

2.2.2.3 Working Capital Management Policies

Following the vital role working capital management is playing a company needs to formulate clear policies concerning the various components of working capital. Key policy areas relate to the level of investment in working capital for a given level of operations and the extent to which working capital is financed from short-term funds such as a bank overdraft (Uyar, 2009). A company should have working capital policies on the management of inventory, trade receivables, cash and short-term investments in order to minimise the possibility of illiquidity and inefficiency (Chittenden, Poutziouris, & Michaelas, 1998).

Nazir and Afza, (2008) opined that Managers making decisions which are not in the best interests of the company; Examples of such suboptimal decisions are giving credit to customers who are unlikely to pay and ordering unnecessary inventories of raw materials. Sensible working capital policies will reflect corporate decisions on: the total investment needed in current assets, i.e. the overall level of investment; the amount of investment needed in each type of current asset, i.e. the mix of current assets; and the way in which current assets are to be financed.

Working capital policies need to consider the nature of the company's business since different businesses will have different working capital requirements (Chittenden et al., 1998). For instance, manufacturing company will need to invest heavily in spare parts and components and might be owed large amounts of money by its customers. A food retailer will have large inventories of goods for resale but will have very few trade receivables. The manufacturing company clearly has a need for a carefully thought out policy on receivables management, whereas the food retailer may not grant any credit at all. Working capital policies will also need to reflect the credit policies of a company's close competitors, since it would be foolish to lose business because of an unfavorable comparison of terms of trade

(Van Horne and Wachowicz, 2004). Any expected fluctuations in the supply of or demand for goods and services, for example due to seasonal variations in business, must also be considered, as must the impact of a company's manufacturing period on its current assets.

Aggressive Working Capital Policy

An aggressive policy with regard to the level of investment in working capital means that a company chooses to operate with lower levels of inventory, trade receivables and cash for a given level of activity or sales (Chittenden et al., 1998). According to them an aggressive policy will increase profitability since less cash will be tied up in current assets, but it will also increase risk since the possibility of cash shortages or running out of inventory is increased.

Conservative Working Capital Policy

A conservative and more flexible working capital policy for a given level of turnover would be associated with maintaining a larger cash balance, perhaps even investing in short-term securities, offering more generous credit terms to customers and holding higher levels of inventory (Chittenden et al., 1998). Such a policy will give rise to a lower risk of financial problems or inventory problems, but at the expense of reducing profitability.

Moderate Working Capital Policy

A moderate policy would tread a middle path between the aggressive and conservative approaches. It should be noted that the working capital policies of a company can be characterized as aggressive, moderate or conservative only by comparing them with the working capital policies of similar companies (Chittenden et al., 1998). There are no absolute benchmarks of what may be regarded as aggressive or otherwise, but these characterisations

are useful for analysing the ways in which individual companies approach the operational problem of working capital management.

2.2.2.4 Consequences of Poor Working Capital Management

Working capital is very essential for success of a business and, therefore, needs efficient management and control. Each of the components of the working capital needs proper management to optimise profit. The consequences of under assessment of working capital according to Van Horne and Wachowicz, (2004) include:

i. Growth may be stunted. It may become difficult for the enterprise to undertake profitable projects due to non-availability of working capital.
ii. Implementation of operating plans may become difficult and consequently the profit goals may not be achieved.
iii. Cash crisis may emerge due to paucity of working funds.
iv. Optimum capacity utilisation of fixed assets may not be achieved due to non-availability of the working capital.
v. The business may fail to honour its commitment in time, thereby adversely affecting its credibility. This situation may lead to business closure.
vi. The business may be compelled to buy raw materials on credit and sell finished goods on cash. In the process it may end up with increasing cost of purchases and reducing selling prices by offering discounts. Both these situations would affect profitability adversely.
vii. Non-availability of stocks due to non-availability of funds may result in production stoppage.
viii. While underassessment of working capital has disastrous implications on business, overassessment of working capital also has its own dangers.

ix. Excess of working capital may result in unnecessary accumulation of inventories.

x. It may lead to offer too liberal credit terms to buyers and very poor recovery system and cash management.

xi. It may make management complacent leading to its inefficiency.

2.2.2.5 Working Capital Management in Developing Economies

The importance of managing working capital is magnified when it refers to firms in developing economies. These firms have many problems (McComick, 1999), such as being small in size (in terms of volume of investment and sales) and lack of resources. The list of problems is long and includes low levels of product and process technology, small product markets, lack of access to capital, lack of physical infrastructure and proper institutional framework. Because of their small size, firms in developing economies may quickly be exposed to problems of production capacity to satisfy the demand they may have for their products and this makes inventory management more relevant. Both human and financial resources of the firms in developing economies are also very limited. The human aspect refers to both skilled labour and knowledgeable, experienced and motivated management. Thus the problems of managing working capital investments and short-term debt may be increased by such lack of managerial knowledge.

Financially, firms in developing countries lack the opportunity of getting the benefit of financial markets. Even if financial markets exist the small firms have less opportunity to go public and benefit from the financial markets as sources of finance. Even banks will hesitate to provide them with long term loans. Small firms are less known and less equipped with appropriate mechanisms that will help them to provide relevant information to potential financiers. Therefore banks consider loans to small firms as risky and expensive because it takes more time for a relatively less benefit. So, because of these reasons short-term debt

management is even more important in developing than developed countries (Fishazion, Von Eije & Lutz, 2001).

Proper working capital management is particularly important for the firms in developing countries in order to solve these problems. For example in Nigeria, the firms have their major investment in working capital assets and they mostly use short-term debts as a main financing source (Akinlo, 2012). According to him, in the absence of long-term investment and capital markets, managers are more over occupied with the short-term decisions affecting working capital. Therefore, it is in working capital related activities that they are trying to capitalise in order to create value for the firms.

2.2.3 Concept of Profitability

According to Raheman et al., (2011) every business is most concerned with its profitability, they defined profitability as the ability to make profit from all the business activities of an organization, company, firm, or an enterprise. Additionally, it shows how efficiently the management can make profit by using all the resources available in the market. One of the most frequently used tools of financial ratio analysis is profitability ratios, which are used to determine the company's bottom line.

Profitability in the words of Sohail et al., (2011) refers to the ability of a firm to earn returns on investment made in its assets that has a positive net present value. They further lament that a financial action that has a positive net present value will create wealth for shareholders and is therefore desirable. A financial action resulting in a negative net present value should be dropped because it will endanger shareholders' wealth. Hill et al., (2012) describes firm's profitability as the ability to generate revenue in excess of the cost of generating such revenue. Essentially, the term is a relative measurable in terms of profit and its relation with

other elements that can directly influence the profit. However, profitability measures management efficiency in the use of organizational resources in adding value to the business. Kurawa (2011) further explains that, turnover in working capital variables will result in profit. The faster the turnover, the more the profit will grow. If the level or volume of current assets continues to grow, the associated costs will also grow and this will reduce the volume of profit. He further asserts that profitability can best be measured in term of Return on Assets, Returns on Equity as well as Returns on Capital Employed.

On the other hand, Rahem et al., (2011) state that profitability ratios show a company's overall efficiency and performance. The y added that profitability and management efficiency are usually taken to be positively associated: poor current profitability may threaten current management efficiency and vice versa; poor management efficiency may threaten profitability. It is related to the goal of shareholders. According to them, wealth maximization and investment in current assets is made only if an acceptable return is obtained. While liquidity is needed for a company to continue business, a company may choose to hold more cash than needed for operational or transactional needs i.e. for precautionary or speculative reasons. It can also be termed as the rate of return on investment.

If there will be an unjustifiable over investment in current assets then this would negatively affect the rate of return on investment (Vishnani & Shah, 2007). The basic purpose of managing working capital is controlling of current financial resources of a firm in such a way that a balance is created between profitability of the firm and risk associated with that profitability (Ricci & Vito, 2000). Profitability is a widely used financial measure of performance; however, some measures of performance are computed based on profit.

A company should earn profit to survive and grow over a long period of time (Rahmen et al., 2011). Based on this, profits are essential, but all management decision should not be profit cantered at the expense of the concerns for customers, employees, suppliers or social

consequences. Return on investment (ROI), the term investment may refer to total assets or net assets. The fund employed in net assets in is known as capital employed. Net assets equal net fixed assets plus current assets minus current liabilities excluding bank loan. The conventional approach of calculating return on investment is to divide profit after tax by investment. Investment refers to pool of funds supplied by shareholders and lenders, while pat represent residue income of shareholders (Rahmen et al., 2011).

Return on Equity (ROE), common or ordinary shareholders are entitled to the residue profits; nevertheless, the net profit after tax represents their return (Rahmen et al., 2011). A return on shareholder's equity is calculated to see the profitability of owners' investment. The shareholders equity or net worth will include paid up share capital, share premium and reserves and surplus less accumulated losses. Net Worth can also be found by subtracting total liabilities from the total assets. The ROI is net profit after taxes divided by shareholders equity which is given by net worth (Rahmen et al., 2011).

Return on Asset (ROA), return on Assets expresses the net income earned by a company as a percentage of the total assets available for use by that company. ROA suggests that companies with higher amounts of assets should be able to earn higher levels of income. ROA measures management ability to earn a return on the firm's resources (assets). The income amount used in this computation is income before the deduction of interest expense, since interest is the return to creditors for the resources that they provide to the firm. The resulting adjusted income amount is thereby the income before any distribution to those who provided funds to the company. ROA is computed by dividing net income plus interest expense by the company's average investment in asset during the year (Pandey, 2005).

2.3 Working Capital Management and Firm Profitability

Existing literature is strongly with the view that efficient working capital improves profitability. In this context, profitability refers to the ability of an enterprise to generate profits from its investments; working capital management affects profitability in several ways (Deloof, 2003). For instance, the management of cash, debtors and stocks affects the level of profits made by an enterprise. According to him, the excessive holding of stocks leads to high stock handling costs, deterioration in the value of stocks due to damage and obsolescence, theft or pilferage by employees and wastage. All these are cost to the firm which reduces its profitability.

Moreover, inadequate stocks also lead to stock out costs and loss of goodwill of the firm, leading to losses or profits. Holding a high level of inventories leads to high capital tied up in stocks. This tied up capital means lost profitability due to forgone interest income which would have been earned if the capital tied up in stocks were invested (Saleemi, 2009). Debtors' management policy adopted by a firm will also determine the cost of bad debts, debt administration, debt collection costs and the forgone benefits due to cash tied up in debtors. This may also include the cost of discounts which may be given to debtors to induce them to make prompt payments arising out of credit sales. Likewise all these costs will reduce the profitability of the firm (Manasseh, 2001).

Defective cash management will lead high costs associated with holding cash, financial distress and lost investment income due hold cash in a non earning form (Manasseh, 2001). Examples of financial distress costs include interest costs, debt restructuring costs and legal costs. Likewise these costs will reduce the amounts of profits made by a firm.

2.4 Review of Empirical Studies on Working Capital Management

In view of the significance of working capital management in realizing optimal working capital position capable of striking a trade-off between liquidity and profitability, several empirical studies have been conducted in different countries using different industry. However, the findings from the studies are mixed and inconclusive. This, calls for further researches on the subject matter like the present studies

For instance, Shin and Soenen (1998) investigate the relationship between working capital management and value creation for shareholders using correlation and regression analysis, by industry, and working capital intensity. They found a strong negative relationship between the length of the firm's net-trade cycle and its profitability. Their findings suggested that one possible way to create shareholder value is to reduce firm's net-trade cycle. In a similar study by Deloof (2003), the results indicated a strong significant relationship between the measures of working capital and corporate profitability. Their findings suggest that managers can increase profitability by reducing the number of days of accounts receivable and inventories. The findings from these studies support the proposition that increase in profitability can be achieved by reducing number of day's accounts receivable and reducing inventories (Wang, 2002).

Lyroudi and Lazaridis (2000) empirically examined food industry in Greek to assess the cash conversion cycle (CCC) as a liquidity indicator and determine its relationship with the current and the quick ratios on one hand; on the other hand, they investigated the implications of the CCC in terms of profitability, indebtness and firm size. They found a significant positive relationship between the cash conversion cycle and the traditional liquidity measures of current and quick ratios. The CCC was found to be positively related to the return on assets and the net profit margin but had no linear relationship with the leverage ratios. Conversely, the current and quick ratios had negative relationship with the debt to equity ratio, and a

positive relation with the times interest earned ratio. Finally, they reported an absence of difference between the liquidity ratios of large and small firms.

Filbeck and Krueger (2005) examine the importance of efficient working capital management by analyzing the working capital management policies of non-financial industries in the USA. Their findings show significant differences among industries in working capital practices overtime. The studies provide evidence that working capital practices, themselves, change significantly within industries overtime.

Lazaridis and Tryfonidis (2006) investigated the relationship of corporate profitability and working capital management for firms listed at Athens Stock Exchange. There results show a statistically significant relationship between profitability measured by gross operating profit and the Cash Conversion Cycle. They conclude that, managers can create profit by correctly handling the individual components of working capital to an optimal level.

Lazaridis and Tryfonidis (2006) study the relationship between working capital management and corporate profitability of listed companies in the Athens Stock Exchange. They used a sample of 131 listed companies for the period 2001-2004. The results from the regression analysis suggest indicated a statistical significant positive relationship between profitability, measured by gross operating profit, and the cash conversion cycle. They claim from their findings that managers could create value for shareholders by handling correctly the cash conversion cycle and by keeping each different component to an optimum level.

In a study of companies listed on the Karachi Stock Exchange, Raheman and Nasr (2007) use a sample of 94 firms for a period of 6 years (1999-2004) and investigated the effects of different variables of working capital management (Average Collection Period, Inventory Turnover in Days, Average Payment Period and the Cash Conversion Cycle) on Net Operating Profitability. The results of the study showed that there is a strong negative

relationship between the variables of working capital management and companies' profitability. On the other hand, the results showed a positive relationship between the size of the company, measured by natural logarithm of sales, and profitability.

In USA, Ganesan (2007) study working capital management efficiency and profitability and liquidity of firms in Telecommunication equipment industry, using a sample of 349 companies for a period of 7 years (2001-2007). Correlation and regression analysis were used in analyzing the variables of the study. The results indicated that there is an insignificant negative relationship between the variables of working capital management and profitability. They conclude that, working capital management is negatively associated with profitability and liquidity. This implies an instance of inefficient working capital in the telecommunication equipments industry.

Afza and Nazir (2007) investigated the relationship between working capital policies and profitability of 208 companies listed on KSE for a period of 1998 to 2005. Using regression analysis, the study found an inverse relationship between companies' profitability and working capital policies which validates the position of Carpenter and Johnson (1983) who opined that there is no any significant relation between firms' risk and level of current assets and current liabilities.

Raheman and Nasr (2007) studied the relationship between working capital management and corporate profitability for firms listed on Karachi Stock Exchange using static measure of liquidity and ongoing operating measure of working capital management during 1999-2004. They found a negative relation between working capital management measures and profitability. Similar to Shin and Soenen (1998), Deloof (2003), results of this study show a strong negative relationship between components of the working capital management and firm profitability. On the contrary, Sharma and Kumar (2011) found results which

significantly depart from the various international studies conducted in different markets that working capital management and profitability is positively correlated in Indian companies. Their study reveals that inventory of number of days and number of day's accounts payable is negatively correlated with a firm's profitability, whereas number of days accounts receivables and cash conversion period exhibit a positive relationship with corporate profitability.

In Kenya, David (2010) examined the impact of working capital management and firm profitability, the findings suggest that more profitable firms takes the shortest time to collect cash from their customers and high inventory levels reduce costs of possible interruptions in the production process and loss of business due to scarcity of products. The study also reveals that the longer a firm takes to pay its creditors, the more profitable it is. In the same vein, Taleb *et al.* (2010) investigated the relation between working capital requirement on one hand and operating cycle of firm, level of economic activity, leverage, growth of firm, operating cash flows, firm size, return on assets, and Tobin's q on the other. Using regression analysis, the study found statistically significant relationship between working capital requirements and operating cash flows. They also found statistically significant relationships between all independent variables and working capital requirements at every year and all period years of the study.

An empirical study from Ghana by Samuel and Benjamin (2011) focused on the working capital management practices and profitability of Banks. The study covers all commercial banks in Ghana, over a ten-year period (1999-2008). Using panel data methodology, within the framework of the random effects model the study concludes that while cash operating cycle has a significantly positive relationship with bank profitability, like debtors' collection period, creditors' payment period exhibits a significantly opposite relationship with profitability. The study also adds that credit risk and exchange risk significantly increases bank profitability similar to that of bank capital structure and size. The study further reports

that listed banks appear to perform poorly as compared to unlisted banks. They conclude by advising banks to improve their cash conversion cycle, they are to do so cautiously since the level of interest income earned by banks depends largely on the level of credit available to them for lending.

A study by Gill (2011) examined the factors the influence working capital requirement of Canadian manufacturing and service firms. The study used a sample of 166 Canadian firms listed on the Toronto stock exchange and applied correlational and non-experimental research design. The results indicate that overall, working capital requirement is positively correlated with operating cycle, return on assets, Tobin's q and industry but negatively correlated with firm size. This study provides evidence from firm specific in relation to working capital management.

Moreover, Alipour (2011) examined the relationship between working capital management and corporate profitability in Iran using a sample of 1063 year observation for companies listed in Tehran Stock Exchange for a period of 6 years (2001-2006). Cash conversion cycle was used as a major tool of measuring working capital management efficiency. The results indicated that there is a significant negative relationship between cash conversion cycle, number of days accounts receivable and inventory turnover in days and corporate profitability and there is a direct significant relationship between number of days accounts of payable. The study therefore implied that managers can create value for their shareholders by decreasing accounts receivable, inventory and cash conversion cycle.

From Jordan, Hayajneh and Yassine (2011) studied the relationship between working capital management efficiency and profitability of Jordanian manufacturing firms using a sample of 53 companies listed on Amman Stock Exchange for a period of 7 years (2000-2006). The data were analyzed through the use of descriptive statistics, Pearson's correlation co-efficient,

ordinary least squares (OLS) and two stage least square regression models. The study found a strong negative relationship between firm's profitability and average receivables collection period, average inventory conversion period, average payment period and cash conversion cycle. Consistently, the findings suggested that, the firms can improve their profitability by managing the various components of its working capital efficiently.

Garcia et al (2011) studies the impact of working capital management and its components upon the profitability of European companies using a sample of 2, 974 non-financial companies listed in 11 European stock exchanges for a period of 12 years (1998-2009). GLS and OLS regression analyses were used to analyze the data. The results revealed that there is a significant negative relationship between gross operating profit which was used as a measure of profitability and cash conversion cycle which was used as a measure of working capital management. They concluded that, managers can create positive value for shareholders by reducing the cash conversion cycle.

Qazi et al (2011) assessed the impact of working capital management on firm's profitability in Pakistan using a sample of 20 companies in the automobile and oil and gas sectors for a period of 5 years (2004-2009). The pooled data were analayzed using regression technique. The result revealed that net working capital (NWC) which represents working capital management efficiency has a strong and positive relationship with profitability. In the same efforts, Sohail et al (2011) studied the relationship between working capital management and profitability of cement industry in Pakistan using a sample of 14 companies listed in Karachi Stock Exchange for a period of 6 years (2004-2009). The data were analyzed using correlation co-efficient and multiple regression analysis. The result indicated that there is relationship between working capital management and profitability in the specific context of cement industry in Pakistan.

In a sample of firms listed in Thailand, Napompech (2012) investigated the impact of working capital management on profitability in Thailand using a sample of 255 companies for a period of 3 years (2007-2009). Regression analysis was used in the analysis and the results revealed a negative relationship between the gross operating profit and cash conversion cycle, receivables collection period, inventory conversion period and average payment period. Therefore managers can increase the profitability of their firms by shortening the cash conversion cycle, inventory conversion period and receivables collection period. However, the findings suggested that they cannot increase profitability by lengthening the payables deferral period.

Quayyum (2012) studied the relationship between working capital management and profitability in Bangladesh manufacturing companies listed on Dhaka stock exchange using a sample of 28 companies selected from four industries: food, pharmaceuticals, engineering and cement industries for a period of 5 years (2005-2009) regression analysis was used to measure the relationship between the variables. The results showed that except for food industry, all other selected industries have significant relationship between the profitability indices of various working capital management components. It was concluded that firms can improve their profitability by having shorter cash conversion cycle.

Usama (2012) extended the work of Raheman and Nasr (2007) on working capital management and its effect on profitability of Pakistani firms, using a sample of 18 food companies listed on Karachi Stock Exchange for a period of 5 years (2006-2010). Pooled least square regression and common effect model were used. The results indicated a significant positive relationship between cash conversion cycle which was used as a measure of working capital management and firm's profitability. He concludes in line with the

recommendation of Raheman and Nasr (2007) that, profitability in food sector can be enhanced by reducing cash conversion cycle.

However, several empirical studies were conducted in Nigeria and the findings are also mixed and inconclusive. For instance, in a study of selected firms in Nigerian by Falope and Ajilore, (2009) shows that firm's profitability is reduced by lengthening the number of day's accounts receivable, number of days of inventory and number of days accounts payable. Specifically, the result shows that shortening the cash conversion cycle improves the profitability of firms in Nigeria.

Akinlo (2012) investigated the determinants of working capital requirements of 66 firms in Nigeria using panel data for the period 1997-2007. The results suggest that sale growth, firm's operating cycle, economic activity, size and permanent working capital are firm specific characteristics that positively drive working capital policy. Leverage, however, is inversely related to working capital requirements. The import of the study was that traditional valuation methods used to quantify the efficiency of corporate working capital policy may be suspect as increased investments in operating working capital may be necessitated by increased business uncertainties. Moreover, in Nigeria Olufisayo (2012) found that sales growth, cash conversion cycle, account receivables and inventory period affect firm positively, while leverage and account payable affect firm profitability negatively.

There are some other studies which empirically established that the relatioship between working capital management and firm's profitability is insignificant or at best moderate. Ajao and Nkechinyere (2012) investigated the effect of working capital management on profitability of selected quoted manufacturing companies in Nigeria for a period of 5 years. The result indicated that each working capital component affect firm's level of profitability at varying rates but these effects when pooled together are not significant.

On the other hand, Uremadu, et al (2012) examined the effect of working capital management and liquidity on profitability of listed firms in the Nigerian productive sector for a period of 2 years (2005-2006). The micro-data were analyzed using descriptive statistics and ordinary least square (OLS) methodology. They discovered a negative relationship between profitability and cash conversion cycle and creditors' payment period and a positive relationship between profitability and inventory conversion period and debtors collection. It was also discovered that cash conversion cycle is the most significant precision variables in influencing profits and leads corporate profitability in Nigeria.

In summary, there are a number of arguments in favour of a direct and positive relationship between a longer cash conversion cycle and profitability. Shin and Soenen (1998) argue that a firm could have larger sales volume with a generous credit policy that extends cash cycle. In that case, the longer cash conversion cycle may result in higher profitability. Additionally, Similary, Deloof (2003) opine that a longer cash conversion cycle might increase profitability because it leads to higher sales. Lyroudi and Lazaridis (2002) concur to this line of reasoning. However, Levely (1996) states that high sales volume does not necessarily equate to high profitability and further argues that a firm losing money each time it sells cannot make it up in volume. Besides, corporate profitability might as well decrease with cash conversion cycle if the costs of higher investment in working capital rise faster than the benefits of holding more inventories and/or granting more trade credits to customers.

However, this study is unique in that, it empirically examined the most crucial working capital components together. Specifically, the study investigate the impact of accounts receivables and payables, CCC, Inventory, operating cash flows and cash ratio on the profitability (measured by gross operating profit) of listed pharmaceutical firms in Nigeria.

2.4 Theoretical Framework

Doubts about managerial effectiveness in utilization of firm resources to achieve a desired level of profit arises as a results of the separation of ownership from control in the modern enterprise; the agent-principal relationship and the consequential conflict of interest have emerged (Fama & Jensen 1983). According to this agency theory, managers as agents are expected to monitor corporate affairs in a most profitable manner so as to maximize the value of the owners as principals and protect the interest of other stakeholders. Under the theory, managers are responsible for managing the business profitably.

One of the factors responsible for the agency problem in the corporate world by the managers is the self-serving interest and incentives. For instance, the interest of the managements usually conflict with the interest of the owners, in which the managers try to meet their goals at the expense of the firm, and this affect the performance in many ways (Roberts, McNulty & Stiles 2005). However, proper monitoring and control could effectively reduce the agency cost caused by separation between ownership and control (Fama & Jensen 1983); thus, efficient resources utilization can be achieved. One of the areas that require adequate attention with regards firm resources is working capital; this is due to its direct relation with the liquidity and the overall profitability of firms.

From the agency perspective, working capital is a managerial activity that managers are expected to efficiently monitor and manage so as to make profit and maximize the owners' value (Stephens & Bartunek, 1997, Dierks & Patel, 1997). Based on agency as managers managed working capital according to prescriptive theory, then it would be expected that businesses would invest in working capital, finance working capital, monitor factors that influence working capital, manage cash, accounts receivable, inventory, accounts payable, the cash conversion cycle (aggregative approach), and measure and analyze performance to

ensure that the long term (fixed) assets are utilized effectively and efficiently (Angelique Nadia, 2000).

Therefore, Scherr (1989) lamented that efficiency in companies working capital can strengthen strong cash flow levels, improve profitability, budgeting and forecasting process, predictability and manageability of results, heighten risk visibility and reduce reaction time. Shin and Soenen (1998) added that efficient working capital is very important for creating value for the shareholders. Particularly, Cote and Latham (1999) opined that the management of receivables, inventory and accounts payable have tremendous impact on cash flows, which in turn affect the profitability of firms. Thus, each of the working capital components (i.e., cash, receivables and inventories) helps in the management of firms in its own particular way. In essence, Brigham, et al. (1999), and Gitman, (1997) state that the theory of working capital management describes how working capital should be managed and demonstrates the benefits in terms of liquidity, solvency, efficiency, profitability, and shareholder wealth maximization which accrue to the company from appropriately managing working capital.

According to Maness, (1994) liquidity is affected by cash, credit, inventory, and accounts payable that form part of the overall cash flow of a business. A business that considers decreasing its levels of cash by carrying too many inventories or providing too much credit endangers its liquidity (Cooper, et al. 1998; Gitman, 1997; Dierks & Patel, 1997; Peel & Wilson, 1996). They add that, declining levels of liquidity, unless remedied, may result in insolvency and eventually bankruptcy as the business's liabilities exceed its assets. From the perspective of efficiency, the business that demonstrate the least working capital per dollar of sales can be considered as managing their working capital efficiently (Tully, 1994). To satisfy the requirement of efficiency, working capital management seeks to ensure that the investment in working capital components is neither too little nor too great. The former could give rise to illiquidity, stock outs, and lost sales, whereas the latter amounts to waste (Tully,

1994). With regards to profitability, the level of investment in working capital and the financing of this investment, at any particular level of output, involve a risk-return trade-off (Madura & Veit, 1988). Generally, the higher the risk the higher the return will be demanded by management and shareholders in order to finance any investment in working capital (Cooper, et al. 1998, Gitman, 1997). Reducing the amount of working capital or fixed assets required by reducing the amount of cash tied up in accounts receivable and inventory while running the business contributes to improving the business's internal performance encapsulated in increases in, and thus shareholder wealth maximization (Stephens & Bartunek, 1997, Dierks & Patel, 1997).

Therefore, the theory that underpins this study is agency theory from efficiency and prescriptive perspectives. The theory provides a framework and a logical linkage between the management of working capital and profitability. Therefore, this study examined the impact of the working capital management and profitability of listed pharmaceutical firms in Nigeria.

2.5 Chapter Summary

In this chapter, review of relevant literature on working capital management and firm profitability is presented. The chapter covers the concept of working capital, working capital management and the concept of profitability; the objectives of working capital management, working capital management policies and working capital management in developing economies. Empirical studies on working capital management and the theoretical framework of working capital management are also discussed and presented.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter centres on the methodology adopted in carrying out this study. It could be described as the road map that guides the direction to find answers to the stated research questions. The main issues discussed include research design, population and sample selection technique, data collection technique, data analysis technique as well as justification of the methods adopted.

3.2 Research Design

This research adopts correlational and ex-post facto designs. This ex-post facto research aims to study the impact of working capital management empirically on the profitability of pharmaceutical companies, while the correlational design is to explore the degree of association between all the variables under consideration. The choice of correlational research design in this study is informed by the fact that, the aim of the design is to investigate the relationships between variables and to estimate the impact of one the variable (independent variable) on another (dependent variable), so as to establish a causal relationship or otherwise among the variables. This is therefore consistent with the objective of the study.

3.3 Population and Sample of the Study

The population of this study is all the nine pharmaceutical companies listed on the floor of Nigerian Stock Exchange as at 31st December, 2011 (See table 3.1). In selecting the sample size, the following criteria are adopted;

(i) Their business activity is not of investment type (non-holding company).

(ii) The company is not suspended from the stock exchange during the period between 2002 and 2011.

Table 3.1 List of NSE Pharmaceutical Firms

S/N	Firms	Sample Selected
1	Ekocorps Plc	
2	Evans Medical Plc	**Selected**
3	Fidson Healthcare Plc	**Selected**
4	Glaxo Smithkline Plc	
5	May & Baker Plc	**Selected**
6	Morison Industries Plc	
7	Neimeth International Pharma Plc	**Selected**
8	Pharma-Deke Plc	**Selected**
9	Union Diagnostic and Clinical Plc	

Source: Nigerian Stock Exchange Fact-book (2010/2011)

Based on the aforementioned criteria, only 5 pharmaceutical companies qualified to be members of the sample of this study. The sample size is shown in table 3.1.

3.4 Sources and Method of Data Collection.

The study use secondary data from secondary sources, which is financial statements of all the sampled firms of the study, for the period of ten years (2002 – 2011). The use of secondary data in this study is informed by the fact that the study is based on the quantitative research methodology that requires quantitative data to test the research hypotheses. The data of the study have been collected from secondary sources only (audited financial statements of the firms). The various data were sourced based on the parameters of the variables, and the respective ratios or percentages taken.

3.5 Techniques of Data Analysis.

To determine the effect of working capital management on profitability of listed pharmaceutical firms, Ordinary Least Square (OLS) regression model is employed as in

Padachi, (2006) and Deloof, (2003). Panel data is used in examining changes in variables over time and differences in variables between subjects. OLS regression technique is used in this study because of the effectiveness and efficiency of the technique in estimating the statistical relationship/impact of one variable on another variable. Hence, this is consistent with the objective of this study, investigating the impact of working capital management on the profitability of listed pharmaceutical firms in Nigeria.

In view of the panel nature of the data (cross-sectional and time series) for the study, the study employed different regression models, which include Ordinary Least Squares (OLS) Model, Fixed Effect (FE) Model and Random Effect (RE) Model. Appropriate tests such as Hausman Specification Test and Breusch and Pagan Lagrangian Multiplier Test for Random Effects are used to in arriving at the most suitable model for the study (OLS model). The study on the other hand conducted robustness tests to ensure the validity and fitness of the results. This includes test for Heteroskedasticity, Autocorrelation and Multicolinearity, this is an efforts to comply with the classical assumption of OLS and the model of the study in general. The analysis is conducted using STATA 10.1 version.

3.6 Model Specification

The model uses Gross operating profit (GOP) as dependent variable and six independent variables, which includes Account Receivable (ACR), Account Payable Management (ACP), Inventory (INV), Operating Cash flow to Sales Ratio (OPCTS), Cash to Current Liabilities (CTCL) and Cash Conversion Cycle (CCC). GOP is reliable in studying the effect of working capital management on firm's profitability because (1) it measures only the performance of the operating activities of a firm, this is because the measurement of the gross operating profit which is sales minus cost of goods sold excludes taxes, interest costs, depreciation and amortization (Lazaridis & Tryfonidis, 2006; Gill et al., 2010), and (2) it is based on the fact

that this measurement focuses on the operational performance. This is because it excludes the income gained through the financial activities by firms, this is done through the exclusion of fixed financial assets, which are deducted from the total assets. GOP is calculated as follows (Lazardis & Tryfonidis, 2006; Deloof, 2003).

GOP = (Sales minus Cost of Goods Sold) / (Total Assets minus Fixed Financial Asset).

We specify our model as:

$GOP_{it} = \alpha_0 + \beta_1 ACR_{it} + \beta_2 ACP_{it} + \beta_3 INV_{it} + \beta_4 CCC_{it} + \beta_5 CTS_{it} + \beta_6 CTCL_{it} + E_{it}$

Where:

ACR_{it}	=	Account Receivable of firm i in year t
ACP_{it}	=	Account Payable of firm i in year t
INV_{it}	=	Inventory of firm i in year t
CCC_{it}	=	Cash Conversion Cycle of firm i in year t
CTS_{it}	=	Operating Cash flow to Sales of firm i in year t
$CTCL_{it}$	=	Cash to Current Liabilities of firm i in year t
E_{it}	=	error term of firm i in year t
α_0	=	is the intercept
β_1-β_6	=	coefficient of independent variables

3.7 Variable Measurement

To study the impacts of working capital management on the profitability of companies, the Gross operating profit (GOP) has been considered as the dependent variable of the research. The explanatory variables to be used as proxies of working capital mangement are (1) Cash conversion Cycle (2) days sales in receivable, (3) days sales in inventory, (4) days payables outstanding, (5) operating cash flow to sales ratio, (6) cash ratio. The choice of explanatory variable is based on the following factors (1) Alternative theories related to working capital management (for example, one school of thought argued that a longer cash conversion cycle

increases firm profitability given that it leads to higher sales, and the other school of thought is with the view that corporate profitability decreases as cash conversion cycle enlongates, particularly if the costs of higher investment in working capital rise faster than the benefits of holding more inventory and/ or granting more trade credit to customers and (2) working capital management variables used in previous studies conducted in other geographic jurisdiction such as Greece, Belgium, U.S, Kenya and Turkey.

The Cash Conversion Cycle (CCC) is used as a comprehensive measure of working capital as it shows the time lag between expenditure for the purchases of raw materials and the collection of sales of finished goods. The longer the cycle, the larger the funds blocked in working capital. Based on the model developed by Richards-Laughlin, (1980), the CCC is defined as the sum of the receivables conversion period (RCP) and the inventory conversion period (ICP) minus the payment deferral period (PDP) that is:

CCC = RCP + ICP – PDP.

Below is a table showing all variables used in the study:

Table 3.2 Variables Measurement

S/N	Variables	Measurement
1	Gross Operating Profit (Dependent)	(Sales – cost of goods sold)/(total assets – fixed financial assets)
2	Accounts Receivables	(Accounts Receivables × 365) / Sales
3	Accounts Payables	(Accounts Payable × 365) /Cost of Goods Sold
4	Inventory	(Inventories × 365) /Cost of Goods Sold
5	Cash Conversion Cycle	Receivables + inventory – payables period
6	Operating Cash Flows	Operating cash flows/sales
7	Cash Ratio	Cash plus marketable securities/current liabilities

Source: Developed by the Researcher based on literature

3.8 Chapter Summary

This chapter focused on the methods and techniques employed to achieve the objectives of the study. It discussed the research design of the study, population and sample selection technique, data collection technique, data analysis technique as well as justification of the methods adopted. The model of the study is also presented as well as the measurement of the variables of the study.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

The analyses and interpretations of the tests conducted on the data collected for the study are presented in this chapter. The chapter begins with the presentation and analysis of the descriptive statistics of the data for the study. This is followed the analysis and discussion of results of the inferential statistics, from which relevant inferences are drawn and the test of hypotheses formulated for the study is conducted. The chapter ends with the discussions of the major findings from the analysis as well as policy implications of the findings.

4.2 Descriptive Statistics

The descriptive statistics of the data collected for the study is presented and discussed in this section. The summary of the descriptive statistics of the data collected is presented in Table 4.1 as follows;

Table 4.1: Descriptive Statistics of the Variables

VARIABLES	**Min**	**Max**	**Mean**	**SD**	**Skewness**	**Kurtosis**	**N**
GOP	0.25	103.33	46.74	22.66	0.5810	2.6514	50
ACR	16	446	132.58	83.48	1.6682	6.4287	50
ACP	5	351	131.24	96.29	0.4004	1.9330	50
INV	25	530	174.56	101.94	1.1142	4.3409	50
CCC	15	472	192.46	114.53	0.7205	3.0265	50
CTS	0.21	142.25	13.05	22.7375	4.0548	22.3581	50
CTCL	0.19	310.13	30.4146	50.1308	3.7980	20.7047	50

Source: STATA Output (Appendix B1)

Table 4.1 shows that our measure of profitability, gross operating profit (GOP) has a minimum value of 0.25 and 103.33 as the maximum value. The average value of the GOP is 46.74 with standard deviation of 22.66, signifying that the data deviate from both side of the

mean value by 22.66. This implies that there is a wide dispersion of the data (profitability of listed pharmaceutical firms in Nigeria) from the mean, because of the large value of standard deviation which is closed to the mean. The kurtosis value of 2.6514 also suggests that majority of the data are higher than mean, as such the data did not meet the Gausian distribution assumption. Similarly, the coefficient of Skewness 0.5810 implies that the data is positively skewed, and thus, the data did not meet the symmetrical distribution assumption.

The results from the table also indicate that the minimum and maximum values of the account receivables (ACR) are 16 and 446 days respectively, with the mean value of 132.58 days and standard deviation of 83.48. This shows that the sample firms have an average of about 133 account receivables collection period, and the standard deviation value implies that there is dispersion from the mean value by 83.48 days in the sample firms. The coefficient of Skewness 1.6682 implies that the data is positively skewed, and thus, the data does not meet the symmetrical distribution assumption. On the other hand, the kurtosis value of 6.4287 also shows that most of the values are higher than the mean, and thus the data did not meet the Gausian distribution assumption.

The descriptive statistics from Table 4.1 shows that account payables (ACP) period has a minimum and maximum value of 5 and 351 days respectively. On average, the accounts payables period in the sample pharmaceutical firms is 131.24 days with standard deviation of 96.29 days. That is, the deviation from the mean is 96.29 days; the coefficient of Skewness 0.4004 implies that the data is positively skewed, and therefore did not conform to the symmetrical distribution requirement. Moreover, the coefficient of Kurtosis 1.9330 also indicates that the ACP variable did not meet the Gausian distribution assumption.

The table also indicates that on average, the days sales in inventory (INV) is 174.56 days with standard deviation of 101.94, implying that the deviation from the mean is 101.94 days in the

sample firms. The minimum and maximum values of days in inventory are 25 and 530 days respectively. The coefficient of skewness 1.1142 indicates that the data is positively skewed, that is, the data did not meet the symmetrical distribution requirement. Similarly, the coefficient of kurtosis of 4.3409 implies that the Gausian distribution is not met.

The Table also indicates that, the minimum and maximum values of cash conversion cycle (CCC) are 15 and 472 days respectively, with the mean value of 192.46 and standard deviation of 114.53. This implies that the companies have average cash conversion cycle of 192.46 days, and the deviation from the mean is 114.53 days. The coefficient of Skewness 0.7205 implies that the data is positively skewed, and therefore did not conform to the symmetrical distribution requirement. Moreover, the coefficient of Kurtosis 3.0265 indicates that the CCC variable did not meet the Gausian distribution criterion.

Moreover, the results from the Table indicate that, the minimum and maximum values of operating cash flow to sales ratio (CTS) are 0.21 and 142.25 respectively, with the mean value of 13.05 and standard deviation of 22.7375. This implies that the listed pharmaceutical companies in Nigeria have CTS of 13.25, and the deviation from the mean is 22.7375. The coefficient of Skewness 4.0548 implies that the data is positively skewed, and therefore did not meet the symmetrical distribution requirement. Moreover, the coefficient of Kurtosis 22.3581 indicates that the CTS variable did not meet the Gausian distribution criterion.

The table also indicates that on average the sample pharmaceutical firms in Nigeria have a cash ratio (CTCL) of 30.4146 with standard deviation of 50.1308, implying that the deviation from the mean is 50.1308 in the sample firms. The minimum and maximum values of CTCL are 0.19 and 310.13 respectively. The coefficient of skewness 3.7980 indicates that the data is positively skewed, that is, the data did not meet the symmetrical distribution requirement.

Similarly, the coefficient of kurtosis of 20.7047 implies that the Gausian distribution is not met.

Following the presentation and interpretation of the descriptive statistics of the data collected for the variables of the study which to a large extent suggested that the data is not normally distributed, the results of data normality test of the variables are presented in Table 4.2 as follows;

Table 4.2 Results of Normality Test

VARIABLES	**W**	**V**	**Z**	**Prob>Z**	**N**
GOP	0.9390	2.868	2.247	0.0123	50
ACR	0.8551	6.813	4.092	0.0000	50
ACP	0.9259	3.484	2.662	0.0039	50
INV	0.9139	4.046	2.981	0.0014	50
CCC	0.9434	2.661	2.087	0.0184	50
CTS	0.5404	21.613	6.554	0.0000	50
CTCL	0.5751	19.983	6.387	0.0000	50

Source: STATA Output (Appendix B2)

The variables of the study are subjected to Shapiro-Wilk (W) test for data normality; the technique test the null hypothesis (that the data is normal), that is, the variable came from a normally distributed population. Table 4.2 indicates that the data for all the variables are not normally distributed, because the P-values are significant at 1% level of significance (ACR, ACP, INV, CTS and CTCL, from Prob>Z value of 0.0000, 0.0039, 0.0014, 0.0000, and 0.0000 respectively): and 5% level of significance (GOP and CCC, from Prob>Z value of 0.0123 and 0.0184). Thus, the null hypothesis (that, the data is normally distributed) is rejected. This may have effects on the results, as most of the parametric tools of analysis including regression assumed that the data is normally distributed.

4.3 Inferential Statistics

In this section, the results of the inferential statistics of the study is presented and discussed. The section covers correlation results and regression results of the model of the study, from which the research hypotheses are tested.

4.3.1 Correlation Results

The summary of the Pearson correlation Coefficients of the variables of the study are presented in Table 4.3 as follows;

Table 4.3 Correlation Matrix of the Dependent and Independent Variables

VARIABLES	GOP	ACR	ACP	INV	CCC	CTS	CTCL
GOP	1						
ACR	-0.3102	1					
	(0.0284)						
ACP	0.1113	0.0793	1				
	(0.4416)	(0.5842)					
INV	-0.3757	0.3901	0.3852	1			
	(0.0072)	(0.0051)	(0.0057)				
CCC	-0.1764	0.6372	-0.0359	0.6379	1		
	(0.2205)	(0.0000)	(0.8047)	(0.0000)			
CTS	-0.2453	-0.1132	0.2935	0.1243	-0.1296	1	
	(0.0860)	(0.4340)	(0.0386)	(0.3897)	(0.3695)		
CTCL	-0.0412	0.1773	-0.3557	0.5375	0.3063	0.0805	1
	(0.7763)	(0.2181)	(0.0243)	(0.0000)	(0.0305)	(0.5783)	

P-Values in Parentheses
Source: STATA Output (Appendix B3)

Table 4.3 present the correlation results between working capital management variables (account receivables, account payables, inventory, cash conversion cycle, operating cash flows to sales, and cash ratio) and the profitability (gross operating profit) of the listed pharmaceutical firms in Nigeria. The table shows that there is a significant negative relationship between profitability (GOP) and account receivables days (ACR) from the correlation coefficient of -0.3102, at 5% level of significance, (p-value 0.0284). This result suggests that the more account receivables days remain outstanding in the sample pharmaceutical firms, profitability decreases. The result from the table indicates that there is

a positive relationship between profitability (GOP) and account payables days (ACP) from the correlation coefficient of 0.1113 which is not significant at all levels of significance (p-value of 0.4416). This implies that the more account payables remain outstanding in the sample pharmaceutical firms, profitability increases, but is not statistically significant.

The table also shows that there is a significant negative relationship between profitability (GOP) and inventory days (INV) from the correlation coefficient of -0.3757, at 1% level of significance, from the p-value of 0.0072. This result suggests that profitability of listed pharmaceutical firms in Nigeria decreases with longer day's sales in inventory. The results from the table also indicate that there is a negative relationship between profitability (GOP) and cash conversion cycle (CCC) days, given the correlation coefficient of -0.1764 which is not significant at all levels of significance (p-value of 0.2205). This result suggests that profitability of listed pharmaceutical firms in Nigeria decreases with longer cash conversion cycle, but is not statistically significant.

Moreover, Table 4.3 shows that there is a significant negative relationship between profitability (GOP) and operating cash flows to sales ratio (CTS) from the correlation coefficient of -0.2453, at 10% level of significance, (p-value 0.0860). This result suggests that profitability of listed pharmaceutical firms in Nigeria decreases with high CTS. The results from the table also indicate that there is a negative relationship between profitability (GOP) and cash ratio (CTCL), considering the correlation coefficient of -0.0412 which is not significant at all levels of significance (p-value of 0.7763).

Following the analysis of the relationships between working capital management variables (account receivables, account payables, inventory, cash conversion cycle, operating cash flows to sales, and cash ratio) and the profitability (gross operating profit) of the listed pharmaceutical firms in Nigeria, the study in the following section presents and discusses the

regression results of the model of the study from which the hypotheses of the study are tested and the relevant inferences drawn about the relationship between working capital management and the profitability of listed pharmaceutical firms in Nigeria.

4.3.2 Presentation of Regression Results and Hypotheses Testing

In this section, the regression results of the model of the study are presented and interpreted. The hypotheses formulated for the study are also tested from the results as presented in Table 4.4 below;

Table 4.4 Summary of Regression Result of the Model of the Study

OLS Model			**Fixed Effect Model**	**Random Effect Model**
Variables	**Statistics**	**Variables**	**Statistics**	**Statistics**
R^2	0.4492	**R^2 Within**	0.4400	0.4042
Adj. R^2	0.3723	**R^2 Between**	0.0119	0.7439
F-STAT	5.84	**R^2 Overall**	0.3629	0.4492
Prob>F	0.0002	**F-STAT**	5.11	
Hausman Chi2	170.77	**Prob>F**	0.0006	
Prob>Chi2	0.0000	**Wald Chi2**		35.06
		Prob>Chi2		0.0000
Random Effects Test:				
Chi2	0.17			
Prob>Chi2	0.6837			

Source: STATA Output (Appendix B4, B7, B8, B9, & B10)

The time-series and cross-sectioned nature of panel data usually led to the production of bias estimators when pooled-OLS regression is used. In this study, relevant tests are carried out alongside other regression models (Fixed Effects and Random Effects models), to confirm the reliability or otherwise of the OLS in this study. The results in Table 4.4 present the regression results of OLS model, fixed and random effects regression models. In choosing the most appropriate model for the study, two important tests are conducted; Hausman

Specification Test and Breusch and Pagan Lagrangian Multiplier Test for Random Effects. The Hausman specification test suggests that Fixed Effects Regression Model is the most appropriate model for the study as evidenced by the Hausman Chi2 of 170.77 with p-value of 0.0000. Similarly, the Breusch and Pagan Lagrangian Multiplier Test for Random Effects, indicated that there is no statistical significant difference (variances) in the panel (from the Chi2 value of 0.17 with p-value of 0.6837), and therefore, OLS model can be used for the study.

Based on the above evidence, together with the test of Heteroskedasticity, Breuch Pagan/Cook-Weisberg coefficient of 0.29 with p-value of 0.5897 (Table 4.5), which proved the absence of the problem of heterogeneity (that is, a constant variance exists in the panel), the OLS regression model is chosen and used in the analysis and hypotheses testing.

The results from Table 4.4 indicate that the independent variables, working capital management components (account receivables, account payables, inventory, cash conversion cycle, operating cash flows to sales, and cash ratio) explained 37.23% of the variations in the dependent variable, profitability of the listed pharmaceutical firms in Nigeria, (adjusted R^2 value of 0.3723). The table also shows that the model is fitted as evidenced by the F-Statistics of 5.84 which is significant at 1% level of significance (P-value 0.0002). Therefore, in the following section, the results of the robustness tests conducted on the data of the variables collected for the study is presented and dscussed.

4.3.3 Results of Robustness Test

In this section, the results of collinearity test and heteroskedasticity are presented and discussed, as shown by Table 4.5 as follows;

Table 4.5 Result of the Robustness Test of the Model of the Study

	Multicollinearity Test		Hetteroscedasticity Test
Variables	VIF	TV	
CCC	3.30	0.3034	
INV	2.49	0.4011	
ACR	1.75	0.5712	
ACP	1.54	0.6476	
CTCL	1.17	0.8536	
CTS	1.15	0.8665	**Breusch & Pagan/Cook-Weisberg Test for Hetteroscedasticity:**
			Chi2 0.29
			Prob>Chi2 0.5897

Source: STATA Output (Appendix B5 & B6)

The classical assumption of OLS regression model assumed that the error terms are normally distributed and independent (that is the error terms are uncorrelated); the explanatory variables are not perfectly correlated (absence of multicollinearity); the variance of the error terms is constant (Homoskedastic). When these assumptions have not been met, the estimators are biased and cannot be use in drawing any inference. However, the results from Table 4.5 proved the absence of perfect multicollinearity among the independent variables, because the smallest tolerance value (TV) is 0.3034, corresponding with the highest variance inflation factor (VIF) of 3.30. The rule of thumb for the Tolerance Value is that any value of 0.1 and below implies the presence of perfect multicollinearity in the estimates, while for the Variance Inflation Factor a value of 10 and above is an indication of perfect multicollinearity.

The evidence from Breuch Pagan/Cook-Weisberg coefficient of 0.29 with p-value of 0.5897 confirms the absence of the effects of heteroskedasticity, that is, there is constant variance in the residuals. Moreover, Breuch Pagan/Cook-Weisberg test is also an evidence of the absence of serial correlation. Similarly, the panel is a micro-panel which the problem of autocorrelation is ineffective. Following the robustness of the results, OLS estimators are used in the test of hypotheses formulated in this study.

4.3.4 Hypotheses Testing

In this section of the chapter, the study tested the hypotheses formulated for the study; Table 4.6 presents the coefficients of the variables of the study from which the hypotheses are tested.

Table 4.6 Regression Coefficients of the Study

	OLS Model		**Fixed Effect Model**		**Random Effect Model**	
Variables	Coef.	P-value	Coef.	P-value	Coef.	P-value
ACR	-0.1259	0.003	-0.1394	0.004	-0.1259	0.002
ACP	0.1283	0.000	0.1330	0.001	0.1283	0.000
INV	-0.1637	0.000	-0.0825	0.158	-0.1637	0.000
CCC	0.1173	0.006	0.0815	0.080	0.1173	0.004
CTS	-0.2828	0.024	-0.3823	0.005	-0.2828	0.020
CTCL	-0.0311	0.577	0.0079	0.909	-0.0311	0.574
CONSTANT	57.2338	0.000	51.2316	0.000	57.2338	0.000

Source: STATA Output (Appendix B4, B7, & B8)

The results in Table 4.6 shows that account receivables (ACR) days has a statistically significant negative impact on the profitability (GOP) of listed pharmaceutical firms in Nigeria as indicated by the coefficient of -0.1259 which is significant at 1% level of significance (P-value 0.003). That is, account receivable days significantly reduces the profitability of listed pharmaceutical firms in Nigeria. Based on this, the study rejects the null hypothesis one (H_{01}) which state that, Receivables collection has no significant impact on the profitability of the listed pharmaceutical firms in Nigeria. Therefore, the study infers that Receivables collection has significant impact on the profitability of the listed pharmaceutical firms in Nigeria, during the period covered by the study.

The table also shows that account payables (ACP) days has a significant positive effects on the profitability of listed pharmaceutical firms in Nigeria, considering the coefficient of 0.1283 which is significant at 1% level of significance (p-value 0.000). That is, account payables day has significantly improved the profitability of listed pharmaceutical firms in Nigeria. Based on this, the study rejects the null hypothesis two (H_{02}) which states that

account payables period has no significant impact on the profitability of the listed pharmaceutical firms in Nigeria. Therefore, the study infers that account payables period has significant positive impact on the profitability of listed pharmaceutical firms in Nigeria, during the period covered by the study.

On the contrary, the results from the table show that the sales days in inventory (INV) has a significant negative impact on the firms in Nigeria, given the coefficient of -0.1637 which is significant at 1% level of significance (from the p-value of 0.000). This suggests that the inventory day's management has a negative significant impact on the gross operating profit of listed pharmaceutical firms in Nigeria during the period of the study. Based on this, the study rejects the null hypothesis three (H_{03}) which states that sales day inventory has no significant impact on the profitability of the listed pharmaceutical firms in Nigeria. Therefore, the study infers that as INV increases the profitability of listed pharmaceutical firms in Nigeria falls.

The results presented in the table also show that the cash conversion cycle (CCC) has a significant positive impact on the profitability of listed pharmaceutical firms in Nigeria, from the coefficient of 0.1173 which is significant at 1% level of significance (from the p-value of 0.006). This suggests that the CCC significantly drive the gross operating profit of listed pharmaceutical firms in Nigeria during the period of the study. Based on this, the study rejects the null hypothesis four (H_{04}) which states that, cash conversion cycle has no significant impact on the profitability of the listed pharmaceutical firms in Nigeria.

The results on the other hand show that the operating cash flows to sales ratio (CTS) has a significant negative impact on the profitability of listed pharmaceutical firms in Nigeria, considering the coefficient of -0.2828 which is significant at 5% level of significance (p-value 0.024). This suggests that the operating cash flows to sales ratio have significantly

impacted on the profitability of listed pharmaceutical firms in Nigeria during the period of the study. Based on this, the study rejects the null hypothesis five (H_{05}) which states that operating cash flows to sales ratio has no significant impact on the profitability of the listed pharmaceutical firms in Nigeria. Therefore, the study infers that CTS grows profitability of listed pharmaceutical firms in Nigeria significantly falls.

Lastly, the results from the table shows that the cash ratio (CTCL) has a negative impact on the profitability of listed pharmaceutical firms in Nigeria, from the coefficient of -0.0311 which is not significant at all levels of significance (from the p-value of 0.577). This suggests that the cash flows ratio has not significantly impacted on the profitability of listed pharmaceutical firms in Nigeria during the period of the study. Based on this, the study fails to rejects the null hypothesis six (H_{06}) which states that cash ratio has no significant impact on the profitability of the listed pharmaceutical firms in Nigeria. Therefore, the study infers that cash ratio does not strongly drive the profitability of listed pharmaceutical firms in Nigeria.

4.4 Discussion of Major Findings

Based on the tests conducted on the data collected and the analyses of the results this study found a significant relationship between the working capital management components (account receivables, account payables, inventory, cash conversion cycle, operating cash flows to sales, and cash ratio) and the profitability of listed pharmaceutical firms in Nigeria. In essence, working capital management explained 37.23% of the variations in the profitability (gross operating profit) of the listed pharmaceutical firms in Nigeria, during the period under review.

In particular, the study found that account receivables (ACR) days has a statistical significant negative impact on the profitability of listed pharmaceutical firms in Nigeria. This finding is

consistent with the findings of Deloof (2003), Laziridis and Tryfonidis (2006), Gill et al., (2010), Garcia-Teruel and Martinez-Solano (2007), Samiloglu & Demirgunes, (2008), Karaduman et al., (2011), Falope and Ajilore (2009), Raheman and Nasr, (2007) and Mathuva (2010). However, the finding contradicts the finding of Sharma and Kumar, (2011).

The study also found that account payables (ACP) days management has significant positive effects on the profitability of listed pharmaceutical firms in Nigeria. The finding supports the findings of Mathuva (2010), and contradicts those of Deloof (2003), Laziridis and Tryfonidis (2006), Garcia-Teruel and Martinez-Solano, (2007) Karaduman et al., (2011), Sharma and Kumar (2011), Falope and Ajilore (2009) and Raheman and Nasr (2007).

Moreover, the results from this study proved that the sales days in inventory (INV) has a significant negative impact on the profitability of listed pharmaceutical firms in Nigeria. The finding supports the finding of Deloof (2003) and Soheila and Torgheh (2008). The study on the other hand, found that cash conversion cycle (CCC) has a significant positive impact on the profitability of listed pharmaceutical firms in Nigeria. The finding is in line with those of Laziridis and Tryfonidis (2006), and contradicts Soheila and Torgheh (2008).

Moreover, the study found that operating cash flows to sales ratio (CTS) has a significant negative impact on the profitability of listed pharmaceutical firms in Nigeria, while the cash ratio (CTCL) has a negative impact on the profitability of listed pharmaceutical firms in Nigeria.

4.5 Policy Implications of the Findings

This study focuses on the impact of working capital management and profitability of listed pharmaceutical firms in Nigeria, the results and findings from the analysis have implications to policy makers, and management of listed pharmaceutical firms in Nigeria. The findings

implied that, if policy makers establish proper and effective policies regarding working capital management profitability could be improved as well as liquidity, which will ensure stable economic condition in Nigeria. The findings also implied more restrictive trade credit policy to customers with less time to make their payments by the management of listed pharmaceutical firms in Nigeria. Moreover, the findings generally implied that the trade credit policy of the Pharmaceutical firms need to be restructured and monitored as macro-economic enivironment changes in ensuring that profitability remains at least afloat.

CHAPTER FIVE
SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

This study investigates the impact of working capital management on the profitabilty of listed phamaceutical firms in Nigeria, using a sample of five companies. The study covers a period of 10 years (2002–2011) and employed correlation research design and OLS regression analysis. Based on the tests conducted on the data collected and the analyses of the results, this study found a significant relationship between the working capital management components (account receivables, account payables, inventory, cash conversion cycle, operating cash flows to sales, and cash ratio) and the profitability of listed pharmaceutical firms in Nigeria. In essence, working capital management explained 37.23% of the variations in the profitability (gross operating profit) of the listed pharmaceutical firms in Nigeria, during the period under review.

In particular, the study found that account receivables (ACR) days has a statistically significant negative impact on the profitability of listed pharmaceutical firms in Nigeria. The study also found that account payables (ACP) days has significant positive effects on the profitability of listed pharmaceutical firms in Nigeria. Moreover, the results provide evidence that the sales days in inventory (INV) has a significant negative impact on the profitability of listed pharmaceutical firms in Nigeria. The study, on the other hand found that cash conversion cycle (CCC) has a significant positive impact on the profitability of listed pharmaceutical firms in Nigeria.

Moreover, it is also found that operating cash flows to sales ratio (CTS) has a significant negative impact on the profitability of listed pharmaceutical firms in Nigeria, while the cash ratio CTS has a negative impact on the profitability of listed pharmaceutical firms in Nigeria.

5.2 Conclusion

Based on the key findings of this research, the study concludes that a significant relationship exists between the management of working capital components (account receivables, account payables, inventory, cash conversion cycle, operating cash flows to sales, and cash ratio) and the profitability of listed pharmaceutical firms in Nigeria. Specifically, the study concludes that, account receivables management has a statistical significant negative impact on the profitability of listed pharmaceutical firms in Nigeria. The study also concludes that account payables management has significant positive effects on the profitability of listed pharmaceutical firms in Nigeria. Moreover, the study concludes that the sales days in inventory has a significant negative impact on the profitability of listed pharmaceutical firms in Nigeria.

The study on the other hand, concludes that cash conversion cycle has a significant positive impact on the profitability of listed pharmaceutical firms in Nigeria. Moreover, the study concludes that operating cash flows to sales ratio has a significant negative impact on the profitability of listed pharmaceutical firms in Nigeria, while the cash ratio has a negative impact on the profitability of listed pharmaceutical firms in Nigeria.

5.3 Recommendations

In line with the findings and conclusions from this study, the study makes the following recommendations:

i. The managers of Pharmaceutical firms in Nigeria should give due importance to working capital management, and emphasize an optimal working capital

levels in their respective firms. This is because of the positive impact of CCC and accounts payables on the profitability.

ii. The managers of Pharmaceutical firms should decrease their days' inventory and days' accounts receivables cycle, by instituting adequate control and flexible credit policy.

iii. The managements of Pharmaceutical firms should employ experts in accounting and finance to help establish and monitor their required liquidity position through efficient working capital.

iv. The result suggest that pharmaceutical firms should keep optimum level of accounts receivable and cash conversion cycle to increase profitability. This could only be possible when pharmaceutical firms give due regard to every component of cash conversion cycle.

v. The managements of Pharmaceutical firms should involve in credit terms bargaining with their suppliers in order to optimize their account payables efficiency which could improve profitability and liquidity positions.

vi. Similarly, the managements of Pharmaceutical firms should adopt the daily stock control policy in order to have an optimal inventory level, which would reduces the cost of holding and ordering and, as a result maximizes profitability in turn.

5.4 Limitations

This study is limited to the listed pharmaceutical firms in Nigeria, therefore the findings is not applicable to other pharmaceutical firms that are not listed in the Nigerian Stock Exchange market. That is, the findings of this study could only be generalized to listed pharmaceutical firms covered in this research.

5.5 Suggestion for Future Research

Future research should investigate how various working capital management components are manipulated by pharmaceutical companies through real activities earnings manipulation which alters the timing or structuring of an operation, investment, and/or financing transaction in an effort to influence sales/ earnings.

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APPENDIX A

List of Listed Pharmaceutical Firms on the floor of Nigeria Stock Exchange

1. EKOCORPS PLC
2. EVANS MEDICAL PLC
3. FIDSON HEALTHCARE PLC
4. GLAXO SMITHKLINE CONSUMER PLC
5. MAY & BAKER NIGERIA PLC
6. MORISON INDUSTRIES PLC
7. NEIMETH INTERNATIONAL PHARMA PLC
8. PHARMA-DEKO PLC
9. UNION DIAGNOSTIC AND CLINICAL SERVICES PLC

APPENDIX B

```
. xtset id year, yearly
       panel variable:  id (strongly balanced)
        time variable:  year, 2002 to 2011
                delta:  1 year
```

1 DESCRIPTIVE STATISTICS

```
. su gop acr acp inv ccc cts ctcl, detail
```

gop

Percentiles		Smallest		
1%	.25	.25		
5%	22.52	12.53		
10%	25.19	22.52	Obs	50
25%	29.99	23.52	Sum of Wgt.	50
50%	38.09		Mean	46.738
		Largest	Std. Dev.	22.65887
75%	63.12	84		
90%	77.26	92.43	Variance	513.4244
95%	92.43	92.84	Skewness	.5810424
99%	103.33	103.33	Kurtosis	2.651389

acr

Percentiles		Smallest		
1%	16	16		
5%	39	37		
10%	57	39	Obs	50
25%	81	42	Sum of Wgt.	50
50%	101		Mean	132.58
		Largest	Std. Dev.	83.47848
75%	171	258		
90%	215	303	Variance	6968.657
95%	303	375	Skewness	1.668233
99%	446	446	Kurtosis	6.428664

acp

Percentiles		Smallest		
1%	5	5		
5%	11	8		
10%	20	11	Obs	50
25%	40	15	Sum of Wgt.	50
50%	100.5		Mean	131.24
		Largest	Std. Dev.	96.29643
75%	207	279		
90%	274	283	Variance	9273.002
95%	283	303	Skewness	.4004129
99%	351	351	Kurtosis	1.933085

inv

Percentiles		Smallest		
1%	25	25		
5%	61	32		
10%	72.5	61	Obs	50
25%	104	71	Sum of Wgt.	50
50%	155		Mean	174.56
		Largest	Std. Dev.	101.9438
75%	248	332		
90%	328	334	Variance	10392.54
95%	334	371	Skewness	1.114182
99%	530	530	Kurtosis	4.340913

ccc

	Percentiles	Smallest		
1%	15	15		
5%	41	36		
10%	53.5	41	Obs	50
25%	97	49	Sum of Wgt.	50
50%	187.5		Mean	192.46
		Largest	Std. Dev.	114.5251
75%	266	420		
90%	335	458	Variance	13116.01
95%	458	464	Skewness	.7204756
99%	472	472	Kurtosis	3.026524

cts

	Percentiles	Smallest		
1%	.21	.21		
5%	.33	.3		
10%	.52	.33	Obs	50
25%	1.58	.4	Sum of Wgt.	50
50%	4.74		Mean	13.0546
		Largest	Std. Dev.	22.73754
75%	17.16	33.29		
90%	31.65	52.81	Variance	516.9957
95%	52.81	60.33	Skewness	4.054756
99%	142.25	142.25	Kurtosis	22.35806

ctcl

	Percentiles	Smallest		
1%	.19	.19		
5%	1.15	1.07		
10%	1.695	1.15	Obs	50
25%	3.5	1.26	Sum of Wgt.	50
50%	13.54		Mean	30.4146
		Largest	Std. Dev.	50.13079
75%	39.59	79.55		
90%	73.8	100.87	Variance	2513.096
95%	100.87	131	Skewness	3.798007
99%	310.13	310.13	Kurtosis	20.70466

2 RESULTS OF NORMALITY TEST

```
. swilk gop acr acp inv ccc cts ctcl
```

Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
gop	50	0.93901	2.868	2.247	0.01231
acr	50	0.85513	6.813	4.092	0.00002
acp	50	0.92592	3.484	2.662	0.00388
inv	50	0.91397	4.046	2.981	0.00144
ccc	50	0.94341	2.661	2.087	0.01843
cts	50	0.54043	21.613	6.554	0.00000
ctcl	50	0.57511	19.983	6.387	0.00000

3 CORRELATION RESULTS

```
. pwcorr gop acr acp inv ccc cts ctcl, star (0.05) sig
```

	gop	acr	acp	inv	ccc	cts	ctcl
gop	1.0000						
acr	-0.3102*	1.0000					
	0.0284						
acp	0.1113	0.0793	1.0000				
	0.4416	0.5842					
inv	-0.3757*	0.3901*	0.3852*	1.0000			
	0.0072	0.0051	0.0057				
ccc	-0.1764	0.6372*	-0.0359	0.6379*	1.0000		
	0.2205	0.0000	0.8047	0.0000			
cts	-0.2453	-0.1132	0.2935*	0.1243	-0.1296	1.0000	
	0.0860	0.4340	0.0386	0.3897	0.3695		
ctcl	-0.0412	0.1773	0.1274	0.1606	0.3063*	0.0805	1.0000
	0.7763	0.2181	0.3778	0.2651	0.0305	0.5783	

4 OLS REGRESSION RESULTS

```
. reg gop acr acp inv ccc cts ctcl
```

Source	SS	df	MS		
Model	11299.681	6	1883.28016	Number of obs	= 50
Residual	13858.1137	43	322.281715	F(6, 43)	= 5.84
				Prob > F	= 0.0002
Total	25157.7947	49	513.424382	R-squared	= 0.4492
				Adj R-squared	= 0.3723
				Root MSE	= 17.952

gop	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
acr	-.1258776	.0406495	-3.10	0.003	-.2078551	-.0439
acp	.1282863	.0330938	3.88	0.000	.0615463	.1950264
inv	-.1637308	.0397238	-4.12	0.000	-.2438414	-.0836202
ccc	.1173096	.0406558	2.89	0.006	.0353194	.1992998
cts	-.2828459	.1211686	-2.33	0.024	-.5272057	-.0384861
ctcl	-.0311467	.0553728	-0.56	0.577	-.1428166	.0805233
_cons	57.23376	6.430136	8.90	0.000	44.26615	70.20136

5 RESULTS OF TEST OF HETEROSKEDASTICITY

```
. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of gop

         chi2(1)      =     0.29
         Prob > chi2  =   0.5897
```

6 RESULTS OF TEST OF COLLINEARITY

```
. vif
```

Variable	VIF	1/VIF
ccc	3.30	0.303385
inv	2.49	0.401067
acr	1.75	0.571189
acp	1.54	0.647627
ctcl	1.17	0.853566
cts	1.15	0.866507
Mean VIF	1.90	

7 FIXED EFFECT REGRESSION RESULTS

```
. xtreg gop acr acp inv ccc cts ctcl, fe

Fixed-effects (within) regression               Number of obs      =        50
Group variable: id                              Number of groups   =         5

R-sq:  within  = 0.4400                         Obs per group: min =        10
       between = 0.0119                                        avg =      10.0
       overall = 0.3629                                        max =        10

                                                F(6,39)            =      5.11
corr(u_i, Xb)  = -0.0809                        Prob > F           =    0.0006
```

gop	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
acr	-.1393763	.0454859	-3.06	0.004	-.2313803	-.0473723
acp	.1330281	.0383821	3.47	0.001	.055393	.2106632
inv	-.0825328	.0572799	-1.44	0.158	-.1983923	.0333267
ccc	.0814885	.0452653	1.80	0.080	-.0100693	.1730463
cts	-.3822875	.1279789	-2.99	0.005	-.6411493	-.1234258
ctcl	.0079106	.0685237	0.12	0.909	-.1306917	.146513
_cons	51.23155	10.59158	4.84	0.000	29.80807	72.65504
sigma_u	10.036639					
sigma_e	17.558889					
rho	.24626438	(fraction of variance due to u_i)				

```
F test that all u_i=0:     F(4, 39) =     1.49                 Prob > F = 0.2248

. est store fixed
```

8 RANDOM EFFECT REGRESSION RESULTS

```
. xtreg gop acr acp inv ccc cts ctcl, re

Random-effects GLS regression                   Number of obs      =        50
Group variable: id                              Number of groups   =         5

R-sq:  within  = 0.4042                         Obs per group: min =        10
       between = 0.7439                                        avg =      10.0
       overall = 0.4492                                        max =        10

Random effects u_i ~ Gaussian                   Wald chi2(6)       =     35.06
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         gop |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         acr |  -.1258776   .0406495    -3.10   0.002    -.2055492    -.046206
         acp |   .1282863   .0330938     3.88   0.000     .0634236    .1931491
         inv |  -.1637308   .0397238    -4.12   0.000     -.241588   -.0858737
         ccc |   .1173096   .0406558     2.89   0.004     .0376257    .1969934
         cts |  -.2828459   .1211686    -2.33   0.020     -.520332   -.0453597
        ctcl |  -.0311467   .0553728    -0.56   0.574    -.1396754    .0773821
       _cons |   57.23376   6.430136     8.90   0.000     44.63092    69.83659
-------------+----------------------------------------------------------------
     sigma_u |          0
     sigma_e |  17.558889
         rho |          0   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. est store random
```

9 HAUSMAN SPECIFICATION TEST

```
. hausman fixed random

                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |     fixed        random       Difference          S.E.
-------------+----------------------------------------------------------------
         acr |  -.1393763   -.1258776       -.0134987        .0204105
         acp |   .1330281    .1282863        .0047418        .0194418
         inv |  -.0825328   -.1637308        .0811981        .0412675
         ccc |   .0814885    .1173096       -.0358211        .0199012
         cts |  -.3822875   -.2828459       -.0994416        .0411917
        ctcl |   .0079106   -.0311467        .0390573        .0403652
------------------------------------------------------------------------------
                           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(6) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =      170.77
                Prob>chi2 =      0.0000
                (V_b-V_B is not positive definite)
```

10 RANDOM EFFECT TEST

```
. xttest0

Breusch and Pagan Lagrangian multiplier test for random effects

        gop[id,t] = Xb + u[id] + e[id,t]

        Estimated results:
                     |       Var     sd = sqrt(Var)
             ---------+-----------------------------
                 gop |    513.4244        22.65887
                   e |    308.3146        17.55889
                   u |           0               0

        Test:   Var(u) = 0
                             chi2(1) =     0.17
                          Prob > chi2 =     0.6837

.
```

APPENDIX C

Appendix II: Data from Listed Pharmaceutical Firms

YEAR	ID	GOP	ACR	ACP	INV	CCC	CTS	CTCL
2002	1	32.15	159	15	72	216	2.07	4.91
2003	1	29.99	158	19	75	213	1.53	3.41
2004	1	31.59	183	21	84	246	1.33	2.92
2005	1	32.71	134	25	91	200	1.34	2.86
2006	1	78.16	124	5	91	210	1.78	3.89
2007	1	92.43	100	11	110	199	1.32	4.3
2008	1	47.66	102	8	141	235	0.4	18.91
2009	1	52.12	80	60	107	127	1.58	5.13
2010	1	52.68	90	40	114	164	4.56	11.18
2011	1	53.81	68	33	105	140	0.3	1.26
2002	2	103.33	86	351	73	191	6.06	64.53
2003	2	92.84	89	303	71	143	12.58	131
2004	2	68.12	130	66	126	189	2.88	64.51
2005	2	32.54	303	56	174	420	8.23	310.13
2006	2	34.43	62	33	61	90	4.92	5.44
2007	2	72.74	83	33	25	75	6.32	6.35
2008	2	84	106	102	32	36	2.9	3.5
2009	2	27.24	39	201	113	49	0.5	0.19
2010	2	12.53	71	272	149	52	142.25	19.32
2011	2	47.67	16	165	134	15	60.33	33.21
2002	3	72.49	204	204	325	325	33.29	13.05
2003	3	76.02	187	209	104	282	3.99	2.27
2004	3	66.54	164	279	282	266	10.15	14.03
2005	3	76.36	149	241	160	267	10.74	15.06
2006	3	28.17	375	250	292	247	32.8	23.3
2007	3	35.5	170	207	282	345	30.5	18.99
2008	3	38.72	199	51	257	305	8.88	19.01
2009	3	38.57	171	82	289	278	0.76	1.07
2010	3	34.18	192	86	185	291	3.76	5.6
2011	3	0.25	446	97	200	249	2.74	1.86
2002	4	60.9	90	173	180	97	0.21	6.91
2003	4	70.53	98	165	154	88	0.33	1.15
2004	4	63.12	86	146	157	97	0.54	1.55
2005	4	57.87	86	145	156	98	0.8	3.23
2006	4	34.86	81	93	185	173	52.81	20.57
2007	4	40.13	69	53	119	135	25.76	62.84
2008	4	37.61	37	38	94	93	17.26	41.98
2009	4	29.64	42	33	123	132	12.03	21
2010	4	28.73	64	44	164	186	4.49	8.42
2011	4	54.81	52	88	77	41	21.32	36.01

2002	5	28.05	89	283	249	55	17.16	70.35
2003	5	60.12	76	185	248	138	15.7	59.22
2004	5	23.61	99	226	221	94	18.28	100.87
2005	5	26.77	89	154	530	464	17.97	79.55
2006	5	29.8	226	99	331	458	17.48	77.25
2007	5	22.52	258	157	371	472	14.21	52.98
2008	5	37.14	200	232	332	300	6.26	39.59
2009	5	23.52	151	276	334	209	2.86	6.23
2010	5	31.27	177	250	218	145	4.31	18
2011	5	30.36	119	197	161	83	2.16	1.84