IMPACT OF WORKING CAPITAL MANAGEMENT ON THE PROFITABILITY OF MANUFACTURING COMPANIES LISTED ON THE NIGERIAN STOCK EXCHANGE

YUSUF AMINU

DOCTOR OF PHILOSOPHY
UNIVERSITI UTARA MALAYSIA
December 2014

IMPACT OF WORKING CAPITAL MANAGEMENT ON THE PROFITABILITY OF MANUFACTURING COMPANIES LISTED ON THE NIGERIAN STOCK EXCHANGE

By

YUSUF AMINU

Thesis Submitted to
Othman Yeop Abdullah Graduate School of Business,
Universiti Utara Malaysia,
in Fulfillment of the Requirement for the Degree of Doctor of Philosophy

PERMISSION TO USE

In presenting this thesis in fulfilment of the requirements for a postgraduate degree from Universiti Utara Malaysia, I agree that the Universiti Library may make it freely available for inspection. I further agree that permission for the copying of this thesis in any manner, in whole or in part, for scholarly purpose may be granted by my supervisor(s) or, in their absence, by the Dean of Othman Yeop Abdullah Graduate School of Business. It is understood that any copying or publication or use of this thesis or parts thereof for financial gain shall not be allowed without my written permission. It is also understood that due recognition shall be given to me and to Universiti Utara Malaysia for any scholarly use which may be made of any material from my thesis.

Requests for permission to copy or to make other use of materials in this thesis, in whole or in part, should be addressed to:

Dean of Othman Yeop Abdullah Graduate School of Business
Universiti Utara Malaysia
06010 UUM Sintok

ABSTRACT

Working capital management refers to the management of the short-term assets of a business. It is very important and plays a vital role for firms' profitability. In spite of its importance, there is a serious dearth of literature on working capital management and profitability especially in sub-Saharan Africa, particularly Nigeria. Therefore, the objective of this study is to investigate the impact of working capital management on the profitability of the manufacturing companies listed on the Nigerian Stock Exchange. Panel data methodology was employed to test this relationship with both the fixed and the random effects estimation techniques. Accordingly, all the manufacturing companies on the Nigerian Stock Exchange totalling 55 were drawn as the sample and the study was conducted for five years (2008-2013). Data were obtained from the financial statements of the companies through the Securities and Exchange Commission. Findings from the panel data regression analysis revealed that average collection period and inventory conversion period were significantly negatively related to profitability, which suggests that the shorter the periods the higher the profitability of the manufacturing companies. However, average payment period was positively and significantly related to profitability, depicting that the longer the period, the higher the profitability. The debt ratio and other current liabilities to the total assets ratio were not significantly related to profitability. Finally, the study provides managerial implications and the direction for future research.

Keywords: working capital management, Nigerian Stock Exchange, profitability, Nigeria.

ABSTRAK

Pengurusan modal kerja merujuk kepada pengurusan aset-aset jangka pendek sesebuah perniagaan. Aset-aset ini sangat penting dan memainkan peranan yang besar dalam menentukan keberuntungan sesebuah firma. Sungguhpun demikian, masih terdapat kekurangan yang serius bagi literatur dalam bidang pengurusan modal kerja dan keuntungan, terutamanya di kawasan sub-Sahara Afrika, khususnya di Nigeria. Justeru, objektif kajian ini adalah untuk menyiasat kesan pengurusan modal kerja ke atas keuntungan syarikat-syarikat pembuatan yang disenaraikan di Bursa Saham Nigeria. Kaedah data panel telah digunakan untuk menguji hubungan ini dengan kedua-dua teknik penganggaran kesan tetap dan teknik penganggaran kesan rawak. Semua syarikat pembuatan di Bursa Saham Nigeria yang berjumlah 55 buah telah dipilih sebagai sampel dan kajian telah dijalankan selama lima tahun (2008-2013). Data diperoleh daripada penyata kewangan syarikat melalui Suruhanjaya Sekuriti dan Bursa. Hasil analisis regresi data panel mendedahkan bahawa tempoh kutipan purata dan tempoh penukaran inventori mempunyai hubungan negatif yang signifikan dengan keuntungan, yang mencadangkan bahawa lebih pendek kitaran, semakin tinggi keuntungan syarikat-syarikat pembuatan ini. Walau bagaimanapun, tempoh purata pembayaran didapati mempunyai hubungan positif yang signifikan dengan keberuntungan. Hal ini memberi gambaran bahawa semakin lama tempoh purata pembayaran, maka akan lebih tinggi keuntungan syarikat. Nisbah hutang dan nisbah liabiliti semasa lain kepada jumlah aset didapati tidak mempunyai hubungan yang signifikan dengan keberuntungan. Akhir sekali, implikasi pengurusan dan hala tuju kajian akan datang turut dikemukakan dalam kajian ini.

Kata kunci: pengurusan modal kerja, kitaran penukaran tunai, keberuntungan, Nigeria.

ACKNOWLEDGEMENT

In the name of ALLAH, most gracious most Merciful, all praises and adorations are to the Almighty for giving me the strength and determination to complete this study. It is a great pleasure for me to express my utmost gratitude for contributions and help of many people, whose assistance made this Thesis possible.

First and foremost, I would like to express my sincere gratitude and deepest appreciation to my supervisor, Associate Professor, Dr. Nasruddin Zainudin, for his tireless help, advise, guidance, patience and wisdom, tolerance, invaluable comments and encouragement throughout the course of my PhD journey. His positive attitudes, maturity, understanding and comments have made this Thesis possible. May ALLAH out of his infinite mercy bless him with Jannatul firdaus for his effort in ensuring the completion of this journey.

I am deeply grateful to my reviewers during the proposal defense stage of writing this Thesis, Associate Professor, Dr. Angappan A/L Regupathi and Dr. Zaemah Zainudin for their constructive criticisms and insightful comments which gave this study a proper shape and direction.

My appreciation also goes to the Dean of Accouting, Professor, Dr. Kamil Md Idris and the staff in the Dean`s office of the School of Accounting, Universiti Utara Malaysia, particularly Mrs. Zulaidah for her support, assistance and necessary guidance. Same appreciation goes to the Dean of Othman Yeop Abdullah Graduate School of Business (OYAGSB) Professor, Dr. Noor Azizi Ismail and all the staff in

OYAGSB particularly Mrs Atira for her tireless involvement in ensuring the arrangement of my Viva Voce.

My special thanks and appreciation are also extended to my sponsors- Federal Polytechnic Kaura Namoda, Zamfara State, Nigeria and the Tertiary Education Trust Fund of the federal government of Nigeria for providing financial support throughout the duration of my study. Same special thanks and appreciation goes to the Securities and Exchange Commission Nigeria, for providing me with much needed data, without which the work wouldn't have been possible.

I wish to extend my warmest thanks to all my friends and colleagues both in Universiti Utara Malaysia and in Nigeria particularly Dr. Abubakar Muhammad Magaji, Dr. Abdullahi Hassan Goron-Dutse, Dr. Mu`azu Saidu Badara, Dr. Kabiru Maitama Kura, Haliru Muhammad, Dr. Abubakar Mohd Sadiq, Lukman Afolabi, Kamoru Mutiu Olaide, Dr. Abdu Ja`afaru Bambale, Hajia Rabi Mustafa, Dr. Bashir Mande, Kynat Mohd Malaysia, Bashir Sarkin daji, Musa Ewugi Salihu, Dr. Abdallah el-refai Jordan, General Faeez Al-sheidfat Jordan, Dr. Raji and Dr. Shehu Inuwa Galoji.

Same appreciation goes to my friends back in Nigeria, Haranji Yakubu, Sagiru Samaila, Zayyan Muhammad, Isah Ibrahim, Bello Ibrahim, Wadatau Adamu, Hussaini Garba, Lauwali Muhammed, Suleiyol Ubwa, Aliyu Maru, Bala Kabiru, Nura currency, Ibrahim Maikaita, Mr. Stanley Iheanacho, Falalu Lauwali, Nasiru Mudi, all colleagues in Accounting Department Fedponam, Mr. Agada Alfred, Muhammad Mashayabo Bala, Abu Bala, my younger colleague Nura Bello, Muhammad Sajo Sanyinna, John Olujewu, Yahaya Isah Hayatuddin, late Dr. Sani Dangulbi, Aliyu Usman Moyi and all CYA members, Kaura Namoda.

Most importantly my special gratitude goes to my dear wife Hajiya Ummah Abbas and my four lovely daughters; Zainab, Aisha (ummi), Fatimah and Asma`u for supporting me with their endless love, courage, patience, sacrifice, understanding, compassion and prayers during my entire PhD Journey.

My special thanks also to Sheikh Mal. Nasir Naibi, Sheikh Malan Falalu Kambarawa, Mal Nasir Amadi, Mal Alaramma and Malam Maniru Sani Khalifa for their untiring prayers.

Special and endless thanks to my late mother Malama Aishatu Yusuf and my late father Malam Yusuf Yahaya for being the genesis of my coming to this world, for their endless love and affection, tears in raising me, guidance and prayers and for giving me the opportunity to excel academically and spiritually. You did not live to see the full growth and fruit of the seed you had sown, to see the only son you had and always love attending the highest level of academic pursuit in life (PhD) to you I remain forever grateful, I dedicate this Thesis.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ABBREVIATIONS

ACP	Average Collection Period
APP	Average Payment Period
CATAR	Current Asset to Total Asset Ratio
CCC	Cash Conversion Cycle
CLTAR	Current Liabilities to Total Asset Ratio
DR	Debt Ratio
FE	Fixed Effect
GOP	Gross Operating Profit
ICP	Inventory Conversion Period
MVA	Manufacturing Value Added
NETOPR	Net Operating Profit
NLS	Natural Logarithm of Sales
NSE	Nigerian Stock Exchange
OC	Operating Cycle
RE	Random Effect
ROA	Return on Assets
SEC	Securities and Exchange Commission
UNIDO	United Nations Industrial Development Organization
WCM	Working Capital Management

CHAPTER ONE

INTRODUCTION

1.1 Background of Study

Literature relating to corporate finance have centered mostly on long-term financial decisions, mainly on investment decisions, company valuations, capital structure and dividends (Afza & Nazir, 2007). The short-term assets and liabilities are important components of total assets and therefore needs to be carefully analyzed (Afza & Nazir, 2007). In view of their importance, there is the need for careful and systematic investigation of these short term assets and liabilities, since they play a vital role for firm`s profitability, risk, as well as its value (Smith, 1980).

Efficient and effective management of working capital is an important component of overall corporate strategy to create the shareholder`s value. Firms try to keep an optimal level of working capital that maximizes the value (Deloof, 2003; Howorth & Westhead, 2003; and Afza & Nazir, 2007). In line with this, working capital management has become one of the most important issues in the organizations (Lamberson, 1995).

Therefore, working capital and its importance is unquestionable (Fillbeck & Krueger, 2005). It directly influences the liquidity and profitability of firm (Raheman & Nasr, 2007). Excellent management of working capital decreases the dependence on external financing due to increased cash flow, thus lowering the chances of default for an organization (Deloof, 2003).

Effective working capital management involves planning and controlling the current assets and current liabilities in a manner that eliminates the risk of inability of a firm to meet due short-term obligations and to avoid excessive investment in these assets on the other hand (Eljelly, 2004; Rao, 1989; & Appuhami, 2008). It therefore, follows that working capital is known as the life giving force for any economic unit hence its management is considered among the most important functions of corporate management (Raheman, Afza, Qayyum & Bodla, 2010). All organizations, either with profit motive or not, no matter the size and nature of the business, require necessary amount of working capital. It is therefore the most crucial factor for ensuring survival, profitability, liquidity and solvency of business (Raheman, *et al*, 2010). Studies on working capital management always face the conflicting objective of profitability and liquidity (Eljelly 2004; Smith & Begemann 1997).

Researchers have approached working capital management in different ways, some investigated on the accounts receivable while others on the inventory management trying to postulate an optimal level that leads to profit maximization (Lazaridis & Tryfonidis, 2006; Besley & Meyer, 1991). According to Deloof (2003), the way that working capital is managed has a significant impact on profitability of firms. Such results indicate that, there is a particular level of working capital management, which potentially maximizes return. Other researchers tend to study working capital management in relation to sectorial or industrial performances, for example, manufacturing, pharmaceutical, non-financial firms and so on. Gill *et al* (2010), Ananiadis and Varsakelis (2008), and Hussain, Farooq and Khan (2012)

studied the relationship between working capital management and profitability in relation to the manufacturing sectors.

Mathuva (2010), Alipour (2011), Garcia-Terual and Martinez-Solano (2007), and Amir and Sana (2006) studied this relationship with respect to non-financial companies listed on various stock exchanges. Furthermore, the working capital management is mostly measured using a popular measure of cash conversion cycle (CCC), as evident in numerous studies on working capital, such as Deloof (2003), Raheman and Nasr (2007) and Ali (2011) which is the time span between the payment for the purchase of raw materials and the final collection of sales of finished goods (Alipour, 2011). Deloof (2003) found that long cash conversion cycle might increase the firm's income, by making sales higher. Conversely, corporate profitability may be lower with the cash conversion cycle, if the costs of investment in working capital rise faster than the benefits of holding more inventories and granting more trade credit to customers (Gill *et al,* 2010). The main components of CCC are the payable account, the receivable account and the inventory. Furthermore, the traditional view point of the CCC is that, according to Vaidyanathan, Lee and Wai (1990) short cash conversion cycle is indirectly related to firm`s value.

For firms that are manufacturing in nature, the current assets constitute more than half of its total assets (Van Horne & Wachowicz, 2004). Also, Akinbuli (2006) posits that poor management of current assets and current liabilities were the major causes of business failure in Nigeria. The above position was corroborated by Soderbom and Teal (2011) in a report on the analysis of the performance of the

Nigerian manufacturing sector, primarily based on the Nigerian Manufacturing Enterprise Survey (NMES) fielded in July and August, 2011.

The study analyzed working capital management in relation to the profitability of manufacturing companies listed on the Nigerian Stock Exchange. The working capital management (WCM) was measured using the cash conversion cycle model, the average collection period, the inventory conversion period, the average payment period for receivable, inventory and payables respectively. This is in line with studies of (Deloof, 2003; Garcia-Terual & Martinez-Solano 2007; Lazaridis & Tryfonidis, 2006 and Raheman & Nasr 2007). To effectively measure the WCM in relation to profitability, the study employed the current asset to total asset ratio and current liability to total asset ratio, in line with studies of Nor Edi & Noriza (2010). The gross operating profit, net operating profit as well as return on assets were used to measure profitability.

The working capital management impact on profitability is considered more important now when global competition erodes prices, margins are low; companies need cash to expand both overseas and internally, to invest in new products and technology and pay down debt, turning to working capital as a source of cash represents a managerial tool. Undoubtedly, a sizeable number of companies have recognized working capital management as a true competitive advantage in ensuring profitability (Ching, Novazzi & Gerab, 2011).

In the light of the above, it is evident that there is a strong conviction of the need to intensify research on effective management of working capital and how it influence profitability especially in manufacturing companies of developing economies like Nigeria where little has so far been done, and little been achieved. The study therefore seeks to address the theoretical and practical/managerial problems and issues therein with a view to proffer solutions and recommendations based on the subsequent findings of the study.

1.2 Problem Statement

The effects of working capital management on corporate profitability have been a focus of substantial amount of empirical research for many years (Falope & Ajilore 2009). These studies have continued to draw different conclusions, depending on the findings, relating to different sectors, industries and environment (Danuletiu, 2010). Notable among these studies are: Shin and Soenen (1998), Deloof (2003), Lazaridis and Tryfonidis (2006) and Raheman and Nasr (2007). Most of these studies findings were inconsistent and were conducted in developed economies (Olubukunola, Uwaigbu & Ben-caleb, 2012). The issue remains open to further research (Ali, 2011). This therefore justifies the need for further study in this area especially in developing economies like Nigeria. An important study worthy of mention here is the work of Gill *et al* (2010). The current study therefore followed the recommendation of Gill *et al* (2010) that future research should investigate generalization of their findings beyond the American manufacturing sector.

The current study is motivated by the fact that Mambula (2002) identified difficulty in getting raw materials as one of the major problems militating against growth and performance of manufacturing companies in Nigeria. Against this background, it was further observed that this problem stems from the existence of bad roads from the rural areas leading to urban cities where the companies are located. This invariably affect the inventory conversion period of most companies and consequently the profitability.

Accordingly, the study of Oyeyinka, *et al* (1996) highlighted poor and delay in remittances from the debtors of manufacturing companies as one key problem responsible for the decline in performance and overall survival of manufacturing companies particularly in Nigeria. This therefore suggests that the average collection period which is an integral part of working capital management is affected. When debtors do not pay back promptly and the average collection period is too long, then the company experiences cash crunch and the turn over rate is tied down, this ultimately affects a company's profitability and may even lead to folding up.

Manufacturing sector plays a catalytic role in a modern economy and has many dynamic benefits crucial for economic transformation. It is a path for increasing productivity relating to replacement of import and expansion of export, creating foreign exchange earning capacity and raising employment and per capita income (Oyeyinka, *et al*, 1996). Moreover, in a typical manufacturing company more than half of the assets comprised of the short-term assets (Van Horne & Wachowics, 2004).

However, considering the population of Nigeria, which is estimated at approximately 160 million people based on 2011 World Bank estimate which ranked the country as the most populous African nation, as well as the size of the economy which is third in Africa, after South Africa and Egypt as well as the largest economy in West Africa, the choice of Nigeria as the environment of this study is considered critical. In addition to that profitability is considered as an important performance measure of companies. Lord Keynes remarked that "profit is the engine that derives all businesses". It is an indicator of company's sustainability and quite essential for expansion. In view of that, the current study focuses on profitability in order to measure the impact of the management of working capital could have on it, in the context of Nigerian manufacturing companies listed on the stock exchange. Many studies have measured the impact of working capital management on profitability namely; Shin and Soenen (1998), Deloof (2003), Afza and Nazir (2007) and a host of others.

Working capital management as highlighted in the background of this study is considered vital as it directly influences the liquidity and profitability of firms. It is also considered as the life giving force for any economic unit hence its management is considered very vital. Based on the above antecedents, the current study is considered as not only significant but timely.

The Nigerian manufacturing companies are facing serious drawbacks as evidenced by Soderbom and Teal (2011) on the report on Nigerian Manufacturing Enterprises Survey (NMES) fielded in July and August, 2011 by the United Nations Industrial Development Organization and Center for the Study of African

Economies, of the Department of Economics, University of Oxford. The report concluded by proposing an increase in the firm level efficiency as a key to reversing the poor performance of the Nigeria`s manufacturing sector. To add to this, the THIS DAY newspaper, a leading newspaper in Nigeria of Saturday 27th October, 2012, carried a United Nations Industrial Development Organization (UNIDO) report. The report stated that "The United Nations Industrial Development Organization (UNIDO) has reported a decline in the growth of the Nigerian manufacturing sector as well as other developing countries". The report emphasized that, "the output from the manufacturing in these countries dropped to the lowest level since the beginning of 2011. It predicted that the growth of manufacturing value added (MVA) in developing countries will slow further to 4.5 percent in 2012, down from 5.4 percent in 2011".

Furthermore, according to the policy guideline and program of the federal republic of Nigeria (2012), the total output from the manufacturing as evidenced from the manufacturers association of Nigeria has continued to decline. The operational difficulties arising from handling of raw materials, poor liquidity position, and excessive debt burden are identified as some of the major impediments. These problems have to some extent directly affects components of working capital management such as the receivables and inventory and by extension affected the profitability of Nigerian manufacturing companies on the stock exchange.

However, few studies have attempted to investigate working capital management and profitability in Nigeria. For example, the study of Falope and Ajilore (2009) studied this relationship using panel data analysis for selected 50

quoted companies in Nigeria. The study's choice of the sample could not be identified, as there was no systematic way which indicated how the sample was chosen and what industry is represented, as the companies cut across service, oil and manufacturing sectors. Another study by Uremadu and Egbide (2012) which studied liquidity and corporate profitability among quoted firms in Nigeria only focused on the liquidity and did not categorically link the findings to the specific research problem.

However, past studies have concentrated on large firms operating within developed money and capital markets of advanced economies. Results obtained from those studies could hardly be used to generalize for relatively small sized firms in Nigeria that operates within rather rudimentary financial markets where firms mostly rely heavily on financing from the owners, short-term bank loans and trade credit to finance their needed investment in working capital (Chittenden, Poutziouris and Michaelas, 1998; Saccurato, 1994).

There is undoubtedly a dearth of literature on specific research studies exclusively on impact of working capital management on corporate profitability of manufacturing companies. Moreover, the choice of manufacturing companies listed on the Nigerian Stock Exchange was informed by their size and vis-à-vis their economic contribution. In the context of foregoing, the current study on impact of working capital management on the profitability of manufacturing companies listed on the Nigeria stock exchange is therefore expected to fill this gap. This is in line with Hofstede (1984) which supported conducting same study in a different environment with varying culture. In view of this, the current study is an attempt to

investigate the impact of working capital management, which of course inventory conversion period is part of, in relation to profitability of manufacturing companies listed on the Nigerian Stock Exchange with a view to ascertain the level of this relationship and to proffer recommendations thereafter. In line with that also the current study intends to focus this time with particular reference to manufacturing sector, where there is a serious dearth of literature.

1.3 Research Questions

In an attempt to address the problems that have been stated, this study seeks to answer the following research questions:

1. Does inventory conversion period (ICP) affect the profitability of manufacturing companies listed on the Nigerian Stock Exchange?
2. Does average collection period (ACP) affect the profitability of manufacturing companies listed on the Nigerian Stock Exchange?
3. Does operating cycle (OC) affect the profitability of manufacturing companies listed on the Nigerian Stock Exchange?
4. Does average payment period (APP) affect the profitability of manufacturing companies listed on the Nigerian Stock Exchange?
5. Does cash conversion cycle (CCC) affect the profitability of manufacturing companies listed on the Nigerian Stock Exchange?
6. Does other current assets to total asset ratio (OCATAR) affect the profitability of manufacturing companies listed on the Nigerian Stock Exchange?

7. Does other current liabilities to total asset ratio (OCLTAR) affect the profitability of manufacturing companies listed on the Nigerian Stock Exchange?

1.4 Research Objectives

a) To investigate the impact of inventory conversion period (ICP) on the profitability of manufacturing companies listed on the Nigerian Stock Exchange.

b) To evaluate the effect of average collection period (ACP) on the profitability of manufacturing companies listed on the Nigerian Stock Exchange.

c) To investigate the impact of operating cycle (OC) on the profitability of manufacturing companies listed on the Nigerian Stock Exchange.

d) To assess the impact of average payment period (APP) as a cash conversion cycle component on the profitability of manufacturing companies listed on the Nigerian Stock Exchange.

e) To evaluate the effect of cash conversion cycle (CCC) on the profitability of manufacturing companies listed on the Nigerian Stock Exchange.

f) To assess the impact of other current assets to total asset ratio (OCATAR) on the profitability of manufacturing companies listed on the Nigerian Stock Exchange.

g) To investigate the impact of other current liabilities to total assets ratio (OCLTAR) on the profitability of manufacturing companies listed on the Nigerian Stock Exchange.

1.5 Scope of the Study

The scope of the study comprises fifty five manufacturing companies listed on the Nigerian Stock Exchange. The study is limited to the manufacturing companies only. More so, the manufacturing sector under consideration covers the following activities as provided by the Manufacturers Association of Nigeria (2011) list, to include, food and beverages, tobacco, pharmaceuticals and chemicals, industrial and domestic rubber and plastic, paper and paper product, electrical and electronics, carpets, leather, wood and metals.

The study covered a five-year period (2008-2012). The five year period is considered adequate to generate sufficient data for the study considering the availability of the data. Also based on the UNIDO report, the period 2008-12 can be considered to be critical for this study. The study used the financial statements of the companies as provided by the Nigerian Stock Exchange. The companies' details and mode of operation are discussed in the subsequent chapters.

1.6 Significance of the Study

The theoretical perspective of this study focuses on the significance of efficient management of working capital in relation to profitability should be equally felt by all types of industries, inclusive of the manufacturing (Ching, *et al*, 2011). This is also supported by Christopher and Kamalavalli (2009). This study is expected to contribute to the literature on the relationship between working capital management and the profitability of firms. This could be viewed from two perspectives. First, it focuses on the Nigerian manufacturing firms where limited researches have been

conducted on such firms recently. Secondly, this study seeks to validate some of the findings of the previous authors by testing the relationship between working capital management and firm`s profitability of the sample firms. Thus, the present study is expected to be an addition to the existing literature developed by previous authors. This position is also upheld by Gill *et al* (2010).

In a more practical perspective, the results of the study is expected to be useful in understanding the dynamics of and, thus understanding the impact of collection policy, inventory policy, as well as payment policy on the profitability of manufacturing firms listed on the Nigerian stock exchange. More so, the study is expected to reveal the effect of other current asset to total asset ratio (OCATAR) and the other current liabilities to asset ratio (OCLTAR) on the profitability of the manufacturing firms listed on the Nigerian Stock Exchange. The results drawn from the study particularly the indices computed for respective companies and the finding thereof could be useful to the manufacturing firms investigated in order to strategize and increase their profitability.

Moreover, looking at the series of problems, challenges, and non-performance being experienced by the Nigeria`s manufacturing sector as highlighted earlier by the United Industrial Development Organization (UNIDO), the current study is expected to come up with some findings which could be useful in helping and guiding the financial managers of the manufacturing firms based on the behaviour of the variables studied especially with regards to future operations and performance.

To add to that also, the Nigerian economy as we shall see in the next chapter is an economy characterized with over reliance on oil as the only major source of foreign exchange earner a situation that is considered not only unhealthy but one-sided sectorial contribution. In the recent times, there have been efforts made by the government to diversify the economy and discourage the over-reliance on the oil products. This effort was sought to be achieved through revamping the manufacturing sector, and other sectors of the economy. In line with this, therefore the little impact the findings in respect of the variables studied could make to the individual companies (manufacturing firms related) could be seen as an effort in the area of research and development. The study is finally expected to contribute to the body of knowledge by providing new basis or for future research in both academia and industry.

1.7 Summary of the Chapter

The chapter started with a general background of the study where a basic foundation of the study was laid. It was followed by the statement of the research problem; the researcher here tried to bring-out the salient issues that justify the study and the gap it is intended to fill. This was followed by the research questions, objectives, its scope and consequently the significance of the study.

The chapter that follows (chapter two) will focus primarily on the review of the existing and relevant literatures in relation to working capital management and profitability.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The purpose of this chapter is to highlight the literature related to the central theme of the thesis, which is working capital management and how it affects profitability. The chapter begins with the concept of working capital management including definition and components. The chapter then proceeds with reviewing important concepts relating to the focus of the study including cash conversion cycle and its components. In line with this, all the independent and dependent variables of the study are highlighted and discussed. This will be followed by the theoretical underpinning of the study. The chapter will then explore discussion of environment of the study i.e. Nigeria, and the problems, prospects and constituents relating to the working capital and profitability of the Nigerian Manufacturing Sector (NMS) and the Nigerian Stock Exchange (NSE).

2.2 Definition of Working Capital Management

According to Van-Horne and Wachowics (2004), working capital management has been defined as the management of current assets such as cash, marketable securities, receivables and inventories. Osisioma (1997) as cited in Imran and Nousheen (2010) described working capital management as the adjustment, regulation and management of balance between current assets and current liabilities

of a firm. Working capital management is sometimes called the short-term financial management. The main difference between long-term financial management and short term financial management is in terms of timing of cash flows. Short term financial decisions typically involve cash flows within a year or within the operating cycle of the firm (Prasana, 2000). Working capital management deals with the management of current assets- inventories, accounts receivable and cash- and their financing (Moles, Parrino & Kidwell, 2011). Mueller (1953) in one of the earliest studies and seminal works on working capital management, defined working capital as capital in current use in the operation of the business. Dong and Su (2010) defined working capital as the current assets that are utilized or used in operating fixed assets for day to day operations. They further stated that, the current assets of working capital serves as the lifeblood of a business enterprise. It was also observed that the success of a firm is based on its effort to make more receipts in terms of cash in excess of disbursements (Jarvis, Kitching, Curran & Lightfoot, 1996; Rafuse, 1996).

Looking at series of definitions highlighted by various authors above, it is clear that working capital management is simply the management of short term assets of business as well as ensuring appropriate composition of its various components for the overall survival of the business.

2.3 Review of Related Concepts and Theories

Under this sub-heading, concepts and theories relating to the study shall be reviewed. Precisely, the liquidity and profitability trade-off in working capital management will be presented and reviewed. The working capital investment policies of

restrictiveness and flexibleness will also be reviewed, and it will be closely followed by the review of all the relevant theories employed in the study. These include theory of risk and return as well as resource-based theory.

2.3.1 Liquidity/ Profitability Trade-offs in Working Capital Management

Naturally, businesses must continuously strive and position themselves to stay ahead of competition in this fast growing and expanding world. It is necessary that an effective working capital management system has to be designed to run the business and make gains in the long run. In our present situation when costs are ever-increasing, companies have to make efficient use of funds in handling the procurement, inventory, processing and distribution of finished goods to the existing customers. And it is common in many businesses or companies decision-making situations that certain goals or objectives of the firm can only be met at the expense of other goals (Dash & Hanuman, 2012). In line with this therefore, if it is not possible to quantify the exact cost-benefit trade-offs among these goals, then it may be necessary for decision makers to rank order the various goals, so that the less important ones will be pursued, after considering the more important ones (Dash & Hanuman, 2012).

In line with the above submission, most empirical studies have established liquidity and profitability as the most important goals of working capital management (Raheman & Nasr, 2007; Shin & Soenen, 1998). In the earliest work of Mueller (1953) on liquidity, he asserted that the character of operations in different industries requires varying degree of liquidity. Therefore, an examination of this

statement would make liquidity appear as a dynamic function of enterprise, although it does not appear clear, whether it is cause or effect. He concludes that, what is certain is the fact that it is through working capital that liquidity is attained.

Mueller (1953) stated that liquid or cash assets are those assets of any kind which may readily be converted into cash and that there are degrees of liquidity in respect of any asset at a particular time. He further explained that for merchandise, being the least liquid of current assets, its possession will adversely influence the character of liquidity of the current assets. Conversely, cash and receivables being the most liquid, their possession will tend to enhance the liquid character of current assets. He maintained that, in some instances, the possession of cash is viewed as the complete attainment of liquidity, while others emphasize the "nearness" to cash possessed by any asset. Liquidity also connotes the speed, relative ease and cost with which an asset is readily turned into cash (Bodie & Merton, 2000). The objective of liquidity management, in the words of Gallinger and Healy (1991) as cited by Zainudin (2006) is to provide for adequate availability and safekeeping of corporate funds under varied economic conditions in order to help achieve the desired corporate objective of shareholder wealth maximization. Various studies examined the antecedents of liquidity under varying circumstances (Almeida, Campello & Weisbach, 2002; Deloof, 2001; Dittmar, Mahrt-Smith & Servaes, 2003; Opler, Pinkowits, Stulz & Williamson, 1999 Gentry, Vaidyanathan, *et al*, 1990; Gitman 1974; Richards & Laughlin, 1980; Skomp & Edwards, 1978; Hill & Sartoris 1995; Moss & Stine, 1989).

Conversely, the importance of profitability cannot be over-emphasized. Profit is the fruit of business (Prasana, 2000). It is that which keeps businesses and firms moving. Therefore to ensure earning of profit, all firms have to invest in profitable investments. In line with this, the level of corporate investments is influenced largely by internal funds (Boyle & Guthrie 2003; Gundavelli, 2006; Bellouma 2011; Clearly, 1999; Jensen 1986; Kim, Mauer & Sherman 1998; Ross, Westerfield & Jeffrey, 2005 and Opler, Pinkowitz, Stulz & Williamson, 1999).

Liquidity and profitability trade-offs could sometimes be a vital decision for all firms and businesses today. This trade-offs simply refers to a firm's current assets decisions which hangs between the objective of having more liquidity in preference to profitability or the other way round. It is a decision that must be done with consideration of the different component of current assets available, the need of a firm at a particular time and the consequences of the decision. This trade-off alternates among the two conflicting objectives of profitability and liquidity depending on the existing scenario (Ross *et al.*, 2005). The trade-off between liquidity and profitability can be described in a form of the following simple curve.

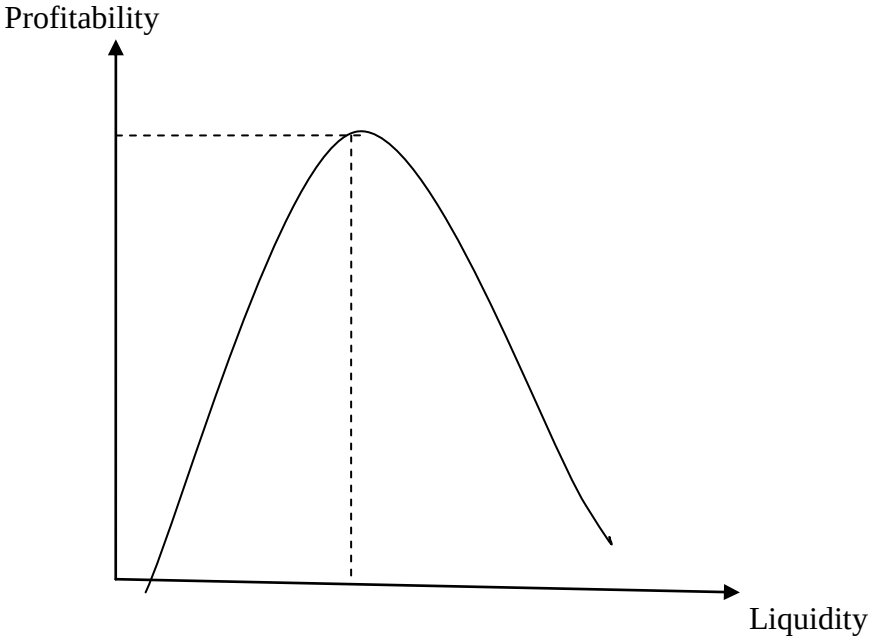

Fig. 2.1
Simple Curve of Liquidity/Profitability Trade-Off

Fig. 2.1 represents a profitability and liquidity trade-off relationship. An analysis of figure shows that surplus liquid assets may negatively affects the company`s profitability. This is because upon exceeding the "necessary" level of liquid assets, the surpluses, when the market risks are stable, paves way for resource utilization to be ineffective (Michalski, 2012). The simple analogy to profitability and liquidity trade-off is that a firm that wishes for high profitability will have to maintain low liquidity, this concept is tested in the context of Nigerian manufacturing firms. In achieving this, a financial manager has to seek the appropriate level of current assets to hold as part of the firm's working capital.

2.3.2 Working Capital Investment and Financing Policies

Working capital investment policy determines the proportion of current assets over total assets a firm should hold. It revolves around a major trade-off implicit in funding net working capital. Specifically, the trade-off involves how much it costs the firm to carry an investment in current assets in the context of the shortages costs associated with the firm's not having enough cash, inventory or accounts receivable (Noryati, Hamisah & Zainora, 2012). Moreso, it involves choosing the optimal level of investment in each current asset type which involves two-fold scenario; that is the opportunity costs associated with having capital tied up in current assets instead of more productive fixed assets and explicit cost necessary to maintain the value of current assets (Marcia, Troy & John, 2012).

Working capital financing policy determines the proportion of current assets that is financed with current liabilities. When a firm uses more current assets without the corresponding increase in the firm's use of current liabilities, this leads to an increase in the level of the firm's net working capital, this may increase the firm's liquidity. The various approaches that firms may adopt to finance its working capital are; maturity matching approach, conservative approach and aggressive approach. The above discussions are necessary and a prelude to aggressive and conservative working capital financing policies.

2.3.3 Aggressive and Conservative Working Capital Financing Policy

An important working capital policy decision is concerned with the level of investment in current assets (Prasana, 2000). Under a flexible policy, current assets investment is high. By this, a business maintains a high cash balance and marketable securities, carries large amount of inventories, and grant generous terms of credit to customers which leads to high level of debtors. However, under a restrictive policy, the investment in current asset is low. By this, firms keep small balance of cash and marketable securities, and provide strict credit terms resulting to a low level of debtors (Prasana, 2000).

However, the important elements that should be considered in the management of short-term financial policy are cash flow, risk and the return level to compensate the risk (Pinches, 1994). Generally, in finance literature, there is always a long discussion on the risk /return trade-off among the policies of working capital (Gitman, 2005; Moyer, McGuigan & Kretlow, 2005; Brigham & Ehrhardt, 2004). In practice, aggressive working capital financing policy ought to result in higher return and risk, while a more conservative working capital financing policy is associated with lower risk and return (Weinraub & Visscher, 1998 and Gardner, Mills, & Pope, 1986). In general, working capital policy is basically a strategy that offers guidelines for the management of short-term assets and short term liabilities in order to reduce the risk of default (Brian, 2009) as cited in (Hussain *et al.*, 2012), as well as influencing the return or profit for the firm.

Normally, if more money is tied up in current assets, it would reduce the rate of return on firm`s investment (Vishani, 2007). A restrictive investment policy deals

principally with the firm's active control and management of current assets with aim of minimizing it (Hussain *et al.*, 2012). According to this policy, current assets are only needed to effectively facilitate the operations of a business. Conversely, a flexible assets management is a passive approach in which current assets grow in size given an open situation (Pinches, 1994). The two alternative policies could be clearly distinguished in the fact that, restrictive investment policy indicates the lower level of investment in short-term assets. Conversely, a flexible investment policy sets a greater proportion of funds in short term assets versus long term assets with the opportunity cost of low level of profit (Nazir & Afza 2009; Czyewski & Hicks, 1992; Blinder & Mancini, 1991).

Many empirical studies were conducted in an attempt to investigate the impact of working capital investment policies on the firm`s profitability. As we shall see below, Fillbeck and Krueger (2005) highlighted the importance of working capital management through the means of investigating and analyzing the working capital management policies of 32 non-financial industries in the United States. The findings of their study showed significant differences that existed among industries in relation to working capital practices overtime. More so, it was found out that these working capital practices change significantly within industries overtime. Other similar studies were conducted by Gombola and Ketz (1983), Long *et al* (1993), Soenen (1993) and Maxwell, Gitman and Smith (1998).

However, in a related research by Weinraub and Visscher (1998), they discussed extensively the issues of working capital policies by using quarterly data for the period 1984-93 of the United States firms. Their study considered 10 diverse

industry groups. The findings of their study concluded that the industries studied had distinctive and significantly different working capital policies.

Soenen (1993) investigated the relationship between the net trade cycle as a measure of working capital and return on investment in the United States firms. The findings from the Chi-square test indicated a negative relationship between the length of net trade cycle and return on assets as a proxy for profitability. Moreover, it was discovered that, this inverse relationship was different in different industries. A significant relationship which was observed for about half of the industries studied revealed that results might vary from industry to industry.

Moreover, Jose, Lancaster and Stevens (1996) sought to extend and validate the findings of Soenen (1993). They did that by considering a larger sample in a relatively longer period. They investigated the relationship between working capital management and profitability of the United States firms. They used the cash conversion cycle, to measure working capital management. In this regard, the restrictiveness of investment in working capital was represented by a shorter cash conversion cycle. The study found that more restrictive working capital management was related with higher profitability.

Furthermore, the study of Afza and Nazir (2007) examined the relationship between the two conflicting working capital management policies. This was done for 17 industrial groups and the sample for the study was 263 public limited companies that were listed on Karachi Stock Exchange for period covering 1998-2003. The study was conducted using cross-sectional data. The study employed the analysis of variance (ANOVA) and the least significant difference (LSD) test.

The findings revealed significant differences among the different industrial group`s working capital management policies. Equally, analysis of ordinary least squares regression found a negative relationship between the degree of restrictiveness of working capital investment policy and the firm`s profitability. Furthermore, some of the studies that attempted to investigate the relationship between working capital management policies and firm`s profitability includes Howorth and Westhead (2008), Eljelly (2004), Ghosh and Maji (2003), Lazaridis and Tryfonidis (2006) and Smith and Begemann (1997).

Broadly, a flexible working capital investment policy results in fewer production stoppages (on account of inventory shortages), ensures quick delivery to customers, and stimulates sales because liberal credit is granted to customers. Of course, these benefits come at the cost of higher investment in current assets. A restrictive working capital policy on the other hand may lead to frequent production stoppages, delayed deliveries to customers, and loss of sales. These are the costs that the firm may have to bear to keep its investment in current assets low (Prasana, 2000). Conclusively, the current study seeks to examine these policies to find out if they affect profitability in the context of Nigerian manufacturing companies.

2.3.4 The Cash Conversion Cycle and its Components

The cash conversion cycle is the length of time from the point at which a company pays for raw materials until the point at which it receives cash from the sale of finished goods made from those materials (Moles *et al.*, 2011). However, the sequence of events that occurs from the point in time that a firm actually pays for its

raw materials to the point that it receives cash from the sales of finished goods comprehensively describes the cash conversion cycle.

The cash received is then reinvested in raw materials, the conversion costs and the cycle is repeated. Ideally, if a firm is profitable, the cash inflows increase over time. Clearly, it is difficult for financial managers to maintain a successful and profitable cycle, and if they have to do so, then several goals have to be achieved.

Undoubtedly, in a vast majority of researches, the cash conversion cycle was used in measuring working capital management through the components (inventory conversion period, average collection period and the average payment period) and the consequent impact on profitability or rate of return. This is evident in studies as (Gentry et al, 1990; Shin & Soenen, 1998; Lyroudi & Lazaridis, 2000; Deloof, 2003; Howorth & Westhead, 2003; Lazaridis & Tryfonidis, 2006; Padachi, 2006; Ozbayrak & Akgin, 2006; Ramachandran & Janakiraman, 2009; Raheman & Nasr, 2007; Gill *et al*, 2010; Dong & Su, 2010; Nobanee, Abdullatif & Al Hajjar, 2010; Alipour, 2011) to mention but a few.

However, turning to details of some of the above mentioned empirical researches, relationship between the length of working capital cycles and profitability were studied by Deloof (2003). The study used a panel of non-financial Belgian firms. The result of his regression analysis indicated that firms with long cash conversion cycles which included account receivables, inventory and accounts payable obtained lower profits, which was measured by gross operating profit as against the firms with shorter cycles. The study of Lazaridis and Tryfonidis (2006)

furthermore, found a positive association between cash conversion cycle and profitability.

The study of Dong and Su (2010) also confirmed a negative relationship of accounts receivable, inventory on the basis of long cash conversion cycle with profitability of firms and a positive association with the account payable cycle. Based on these findings, Dong and Su (2010) emphasized on the necessity of optimizing these cycles (ensuring them on acceptable level) which will no doubt create an enabling environment for increasing shareholders' value. Additionally, Zariyawati *et al* (2009) examined the relationship between the cash conversion cycle and the profitability for Malaysian firms for a period of 1996-2006. Conclusively, their findings were in conformity with the studies mentioned above.

However, the issue of either, longer or shorter cash conversion cycle and the resultant effect on profitability is contextual and varies according to the incidental components and circumstances in the working capital management. Shin and Soenen (1998) highlighted, by posing a question that, whether a short cash conversion cycle is beneficial for the company's profitability? They continued, by saying that, a firm can have large volume of sales with a considerate credit policy, which invariably extends the cycle. In this situation, most likely, the longer cash conversion cycle may result in higher profitability. However, this is contrary to the normal view of the relationship between the firm`s profitability and the cash conversion cycle, which asserts that, other things being equal, a longer cash conversion cycle reduces the profitability of a firm.

There are basically three main components of the cash conversion cycle namely: the average collection period, the inventory conversion period and the average payment period.

The average collection period (ACP) is denoted by:

$$\textbf{ACP} = \frac{\text{Receivables}}{\text{Sales per day}}$$

The inventory conversion period (ICP) or inventory turnover in days is denoted by:

$$\textbf{ICP} = \frac{\text{Inventory}}{\text{Cost of goods sold per day}}$$

While the average payment period (APP)

$$\text{APP} = \frac{\text{Payables}}{\text{Purchases per day}}$$

To sum it up therefore: CCC = ACP + ICP – APP.

Based on the discussion so far, it is worthy to note that this study intends to measure working capital management comprehensively through all the above mentioned components as dimensions or independent variables. This is in line with all the above mentioned studies which used the cash conversion cycle as a proxy for working capital management in examining its relation to profitability.

It is however to be noted that the three parameters or periods of CCC were used in all the studies because the three of them in aggregate forms the CCC. Here the attempt is to analyze them individually as independent variables. Conclusively, the concept of CCC and its components ICP, ACP, and APP are reflections of the amount of inventory, receivables and payables as key components of working capital maintained by the firms. This study uses these measures within the context of Nigerian manufacturing firms listed on the stock exchange.

2.3.5 The Relevant Theories in the Study

Theories are instruments, and not particularly solution to problems. We are not to lie back against them, they are catalysts we use to move forward, and occasionally make nature over again based on their aid (William & Heins, 1964). Studies employ theories relevant to the area of the study, in order to have a solid philosophical base, undisputed foundations and above all proper understanding of the context under study.

Therefore, this study intends to employ the theories of risk and return, and resource-based in explaining the relationship between working capital management and profitability.

2.3.6 Risk and Return Theory

The risk and return theory is one of the most important theories in portfolio management. The relationship between risk and return has received considerable

attention from researchers in Business, Economics and Finance (Mukherji, Desai & Wright, 2008). Furthermore every decision with respect to investment is based on the risk and return relationship (Richard, Stewart & Franklin, 2008).

However, in order to integrate the risk and return theory in the working capital management and profitability context, it is imperative to appreciate that, one of the cardinal decisions in working capital management is the trade-off between liquidity and profitability. If a firm chooses to be liquid it should be at the expense of the profit and vice-versa. This justifies why it is felt the risk and return theory is quite important in this study. Accordingly, an in depth look at the relevant concepts of risk and return has to be done in order to be able to understand it`s theoretical base. Knight (1921) attempted in his classic work to distinguish between the concept of "risk" and "uncertainty". He describes "risk" as objective and measurable, while uncertainty as subjective and unquantifiable. Equally, Williams and Heins (1964) portrayed "uncertainty" as subjective doubt regarding outcome in a given situation. Risk is the existence of states beyond the control of the decision maker which affects the outcome of his choices (Mullen & Roth, 1991).

Therefore, the degree of a given risk is a function of size of the perceived loss and its probability. "Uncertainty" plus lack of knowledge about the exact outcomes of an action are part of the important components of risk-related decision making (March, 1994). According to March (1994), two broad theorists schools exist with respect to risk and decision making. First, is the school of formal theorists and the second is that of behavioural decision making. The formal theorists view risk as a

mark for the residual variance in rational choice theory. The perception here is that risk preference is responsible for any deviation in behaviour observed from the normal behaviour which has prevailed by considering money and maximization of monetary value. Conversely, the behavioural theorists of decision making conceptualize the cognitive and behavioural processes that precedes decision making. Both dimensions of this theory could be used in different contexts to explain working capital relationship with profitability. For example, the decision by a manufacturing company to employ a restrictive working capital investment policy has to be done at the expense of a flexible policy. This particular decision is relevant to other current assets to total assets ratio (OCATAR) which is one of the explanatory variable of this study.

However, two conflicting attitudes are always associated with the risk. That is, the risk seeking behaviour, and the risk aversion as well as risk neutral behaviour. Risk seekers always have the tendency of preferring of choices involving a greater probability of a risk. Mostly, at the stage of evaluation, risk seekers take information at the face value (Muller & Roth, 1991). The commonest notion of risk seekers is the under estimation of risk, this is done by over estimating gains and relegating losses. The main focus of risk seekers is on the opportunities for gain (Tiegen & Brun, 1997).

Conversely, risk averters are more inquisitive and pay more attention to the effects of their decisions and as a result of this psyche, they tend to seek for more information on possible outcomes, and hence adopt worst-case situation (Mullen & Roth, 1991). Risk averters are completely opposite of risk seekers, in the sense that

they (risk averters) over estimate losses and underestimate gains. Mostly at the beginning, risk averters tend to perceive risk, quite higher than the risk seekers. Risk averters pay more attentions on the possibility of a loss on personality disposition account (Tiegen & Brun, 1997). The risk neutral lies between the two extremes.

In line with this, the theory of risk and return could be used in this study to explain the trade-off between liquidity and profitability in working capital management. More so, the theory is useful in the firm's decision in either lengthening or shortening the cash conversion cycle with respect to receivable, inventory or payables as some of the explanatory variables of the study considering either of the actions in the context of working capital management. A firm's inventory conversion period, its average collection period or average payment period may affect liquidity or profitability. For example, a shorter inventory conversion period increases a firm's profitability while exposing the firm to illiquidity. However, where a firm has a high liquidity position, then that may be achieved at the expense of greater profitability. Also greater concentration of current assets such as cash and inventories may reduce risk and possibly return. Where a firm has more of current liabilities, undoubtedly it will have a high risk tendency but may have high profitability.

2.3.7 Resource-based theory

Resources are the basis of business survival and corporate profitability. The resources could either be human or material. When taking stock of firm resources, a distinction needs to be made between resources and capabilities. Resources are

inputs into the production process, they are considered as the fundamental units of analysis. The resources of a firm include items such as capital equipment, patents, brand names, the skill associated with individual employees, finance and so on.

According to the proponents of resource-based theory, independently, fewer resources are productive. Any productive activity must require the coordination and cooperation of teams of resources, while a capability is viewed as the ability or capacity of a team of resources to perform certain activity or task. Therefore, by implication resources are the sources of a given firm's capability (Williamson, 1984). Resource-based theory is used in the context of current study to explain the ability of individual businesses as to ensure effective management of the short-term assets of the business (Williams & Heins, 1964). This therefore connotes that managers have individual-specific resources that facilitates and ensures the recognition of new opportunities, effective assembling of resources as well as the psyche of making payments to creditors as well as recovering of receivables from debtors as and when due to ensure effective management of working capital and ultimately the firm's profitability. The theory is also considered relevant in the context of inventories and receivables that are important resources of manufacturing companies. In essence, managing working capital is managing the entire short-term assets of a company. It is linked to the framework of this study on the basis of average collection period, inventory conversion period and the average payment period as proxies of receivables, inventories and payables. Additionally, natural logarithm of sales was used as a proxy for size as a control variable in the model to

control for the effects of size on profitability. This therefore has gone along way to show the relevance of the resource-based theory in the model and in this study.

2.4 Review of Empirical Studies on Working Capital Management and Profitability

Numerous empirical studies were conducted globally to measure the extent of relationship or association between working capital management and corporate profitability as dependent variable (Shin & Soenen, 1998; Deloof, 2003; Pioters, 2004; Lazaridis & Tryfonidis, 2006; Padachi, 2006; Raheman & Nasr, 2007; Garcia-Terual & Martinez-Solano, 2007; Singh & Pandey, 2008; Charkraborty, 2008; Nazir & Afza, 2009; Falope & Ajilore, 2009; Raheman et al, 2010; Gill *et al.*, 2010; Dong & Su, 2010; Nor Edi & Noriza, 2010; Danuletiu, 2010; Imran & Nousheen, 2010; Mathuva, 2010; Alipour, 2011; Ali, 2011; Dhar, 2011; Bellouma, 2011; Enqvist, Graham & Nikkinen, 2012; Moradi, Salehi, & Arianpoor, 2012; Khan, Jawaid, Arif & Nadeem, 2012; Ramana, Azash & Krishnaiah, 2012 and Attari & Raza, 2012).

The above empirical studies were conducted to investigate the relationship between working capital management and profitability in different countries (Environment), different industries, and with different approaches. However, there were significant divergences in the results relating to the effect of the various components of working capital on profitability. For example, Deloof (2003) found a negative and statistically significant relationship between account payable and profitability, whereas Garcia-Terual and Martinez-Solano (2007) find no such

measurable influences in a sample of Spanish SME`s. This study therefore intends to systematically and meticulously look at those studies with respect to their findings since most of the studies were conducted in different countries, sample and industries so that it can form the basis of the current study.

Shin and Soenen (1998) measured working capital management (WCM) by the net-trade cycle. The study utilized a sample of 58,985 firm years which covered the period between 1975 and 1994. The findings of the study indicated a strong negative association between the firms` net trade cycle and its profitability. Also individual firms' stock returns were also significantly negatively correlated with length of the firms' net-trade cycle (NTC). Therefore, considering the negative relationship between debt and market value, the true benefits from constricting the net-trade cycle (NTC) comes from reduction in assets rather than by increases in payables (Shin & Soenen, 1998). They therefore suggested in the final analysis that, reducing the firm`s net trade cycle to a reasonable minimum is one way to create shareholders value and it should therefore be a major concern for finance managers and executives. From this finding therefore, it is clear that had the NTC extend longer, the profitability could have been affected negatively.

Deloof (2003) utilized a total sample size of 1,009 large, Belgian non-financial firms for the period covering 1992-1996. The results indicated that, there was a negative association between profitability, which was measured by the gross operating profitability and the cash conversion cycle, number of days account receivable, and inventories. The study suggested that corporate profitability can be increased by the managers through reducing the number of day accounts receivables

and inventories. By implication, firms' profitability could be higher when the number of days accounts receivables and inventories are shortened. Shortening of these means the cash is not tied down and could be turned over as much as possible to yield more returns. On the opposite direction, longer days may negatively adversely affect the companies' profitability.

In another prominent study, Lazaridis and Tryfonidis (2006) investigated on a sample totalling 131 listed companies on the Athens Stock Exchange for period covering 2001-2004. The profitability was measured using gross operating profit. The regression analysis results revealed that there was a statistically significanct relationship between profitability and the cash conversion cycle. They assert that managers could create value for shareholders by handling correctly the cash conversion cycle and keeping each different component to an optimum level.

Padachi (2006), had a sample 58 manufacturing Mauritian firms, and employed panel data analysis for period ranging from 1998-2003. The results of regression indicated that high investment in inventories and receivables is associated with lower profitability. Based on this finding, it is clear that a flexible working capital investment policy (where investment in current assets is higher) is not the best alternative. It therefore indicates that lower investment in current assets (restrictive policy) is associated with a higher profitability.

However, in another study conducted by Raheman and Nasr (2007), the study used a sample of 94 Pakistani firms listed on Karachi Stock exchange for the period covering 1999-2004. The findings of the study indicated a negative relationship between all the variables of working capital management including average payment

period, inventory turn-over in days, average collection period and cash conversion cycle and profitability. The study equally indicated that the firm size, measured by the natural logarithm of sales, had a positive relationship with profitability. Based on this study's findings, even the average payment period was negatively related with profitability and that the shorter it takes the firms to pay their suppliers, the higher their profitability. One possible reason could be the possibility of enjoying trade discounts, good prices and offers as a result of prompt payment, the combination of these may result in higher profitability.

However, Garcia-Terual and Martinez-Solano (2007) studied small and medium enterprises (SMEs) in Spain. The study covered a period from 1996-2002 and utilized a total sample of 8,872 small and medium enterprises. The study found a significant negative relationship between SMEs profitability and the number of days account receivable and day inventory. The study could however not confirm that the number of day accounts payable affects SMEs profitability (measured through return on assets). They affirm that managers can create value by reducing their firm`s inventories and the number of days accounts receivable. Making the cash conversion cycle short also improves the firm`s profitability.

Furthermore, Nazir and Afza (2009) investigated a sample of 204 non-financial firms listed on Karachi Stock Exchange. The study was for a period covering 1998-2005. Findings of the study showed a significant difference among the firms' working capital requirements and financing policies across different

industries. The results of the regression found a negative relationship between the extent of investment in working capital and the firms` profitability.

Moreover, the study of Falope and Ajilore (2009) investigated 50 Nigerian quoted non-financial firms for a period covering 1996-2005. The study found a significant negative relationship between net operating profitability and the components of working capital including average payment period, inventory turn-over in days, average collection period and the cash conversion cycle. The results of the study suggested that managers can create value for their shareholders if the firms manage their working capital in the most efficient ways that is reducing the number of days account receivable and inventories to optimum levels.

Raheman *et al* (2010) studied the manufacturing sector in Pakistan for a period covering 1998 to 2007, using a balanced panel data of 204 manufacturing firms listed on Karachi Stock Exchange. The regression results indicated that the cash conversion cycle, net trade cycle and inventory turn-over in days significantly affected the performance of the firms. They also found that manufacturing firms are generally facing problems with their collection and payment policies. In their findings, firm size, financial leverage and sales growth were also found to have significant effect on the firms' profitability. The study also discovered that firms in Pakistan are following flexible working capital management policy, and they therefore need to improve their collection and payment policy. The study also found that efficient management and financing of working capital can increase the operating profit of the manufacturing firms. For this to be achieved, the study

recommends that specialized persons in the fields of finance should be hired by the firms for expert advice on working capital management in the manufacturing sector.

Another study by Gill *et al* (2010) utilized a sample of 88 American firms listed on New York Stock Exchange for a period of 3 years from 2005-2007. The results of the study found a statistically positive significant relationship between the cash conversion cycle and the profitability. The study measured profitability by the gross operating profit. They therefore recommend that managers can create profits for their companies by handling correctly the cash conversion cycle, and by keeping accounts receivables at an optimum level as well.

Dong and Su (2010) utilized a total sample size of 130 firms listed on the Vietnamese Stock Market for the period covering 2006-2008, with observations totaling 390. The study excluded firms in the financial sector comprising banking and finance, insurance, leasing business, service and renting. The findings of their study indicated that there is a strong negative relationship between profitability and the cash conversion cycle.

However, Nor Edi and Noriza (2010 utilized secondary data from Bloomberg`s database of 172 listed companies randomly selected from Bursa Malaysia's main board for a five year period from 2003 to 2007. The correlation and multiple regression analysis results show that there are significant negative associations between working capital variables and firm performance. The study highlighted the importance of managing working capital requirements to ensure an improvement or increase in firm`s market value and profitability.

2.4.1 Inventory Conversion Period and Profitability

Inventory conversion period (ICP) is used as a proxy for inventory management. The ICP is considered as one of the explanatory or independent variable of this study. ICP has been used by numerous empirical researches (Rehman, 2006; Lazaridis & Tryfonidis, 2006; Raheman & Nasr, 2007; Mathuva, 2010; Gil *et al.*, 2010; Narwara,P., 2004; Nobanee, *et al.*, 2010; Zubairi, 2010; Schein, 2009). Findings relating to inventory conversion period`s impact on profitability has equally been inconsistent based on previous different studies.

The findings of Rehman (2006) showed that there is a strong negative relationship between inventory conversion period and profitability of firms, signifying that a shorter inventory conversion period should increase profitability.

Moreover, Lazaridis and Tryfonidis (2006) found a significant positive relationship. This finding is contrary to the findings in most studies. However, this situation could be likened to a context where keeping the inventories for a longer period is economically better and that the inventories must not be easily perishable. Similarly, Raheman and Nasr (2007) found a negative relationship between inventory conversion period and profitability. The simple analogy to this, is that, if the length of the inventory conversion period is increased, it will negatively affect the firm`s profitability.

Furthermore, Mathuva (2010) studied the relationship between firm`s working capital management components and its profitability. The study utilized a sample of 30 firms listed on Nairobi stock exchange. A negative relationship was

found between firm`s inventory conversion period and profitability which denotes that the shorter the inventory conversion, the higher the firm profitability.

Consequently therefore, the inventory conversion period (ICP) as a component of cash conversion cycle has been used in numerous studies when relationship between working capital management and profitability is investigated as seen above. This study also employ same variable in establishing this relationship. The next explanatory or independent variable is the average collection period (ACP).

2.4.2 Average Collection Period and Profitability

The average collection period is considered in this study as a proxy for receivables management. It is also considered as one of the independent variables of this study. Based on the above, this study analyzes the concept of average collection period as a proxy of receivable management.

In view of the foregone discussions numerous empirical researches have investigated the relationship between average collection period as partial component of cash cycle and the profitability of firms (Deloof, 2003; Rehman, 2006; Soenen, 1993; Smith and Begemann, 1997; Ghosh & Maji, 2003; Hill *et al*., 2000; Mian & Smith, 2009; Singh, 2008; Ganesan, 2007; Appuhami, 2008; Harris, 2005; Hawawini et al, 1986; Chiou, *et al*, 2006; Kargar & Blumenthal, 1994; Sathamoorthi, 2002; Kaddumi & Ramadan, 2012; Al-Taleb *et al.*, 2006; Chowdhury & Amin, 2007; Ramachandran & Janakiraman, 2009; Sayaduzzaman,2006).

Furthermore, from the above mentioned studies, there has been conflicting findings with respect to the relationship between the average collection period, one of the proxies for cash conversion cycle and corporate profitability. For example, Deloof, 2003; Afza and Nazir, 2007; Dong and Su, 2010; Raheman and Nasr 2007; Chiou, *et al*, 2006 and many more found a negative relationship between average collection period and profitability. This seems to be the most widely found, suggesting that managers can create value by reducing their firm's number of days account receivable. While in some of the studies e.g. Lazaridis and Tryfonidis (2006) this relationship was found as positive. In line with such finding therefore, shortening the average collection period will not always result in higher profitability.

Similarly, Gill *et al* (2010) found a positive relationship between the average collection period and gross operating profit. Furthermore, Garcia-Terual and Martinez- Solano (2007) found a positive relationship. Conclusively, most studies have found this variable to have a negative significant relationship with profitability depicting that a shorter collection period is more profitable since cash will not be tied down with debtors and so it could further be re-invested to generate more returns. On the other side, a few studies (Lazaridis & Tryfonidis, 2006; Gill, et al, 2010) reported a positive significant relationship between ACP and profitability connoting that a longer collection period leads to higher profitability. Basically, this happens possibly when allowing debtors a longer period could make them more loyal to the company and increase their patronage and total purchases which may lead to higher profitability.

2.4.3 Operating Cycle and Profitability

Operating cycle (OC) refers to the average of time between receipt of raw materials and receipt of cash for the sale of finished goods made from those materials (Moles *et al.*, 2011). Undoubtedly, the cash conversion cycle, is related to the operating cycle, but the main distinguishing feature is that, the cash conversion cycle (CCC) does not begin until the firm actually pays for its inventories, not merely the receipt of the inventories. Therefore, contrary to operating cycle, the CCC measures the length of time between the actual cash outflows for materials and the actual cash inflows from sales. The operating cycle constitutes only the receivables and inventories, while the CCC constitutes the receivable, the inventories and the payables.

The operating cycle employed in this study is an additive function. Lazaridis and Tryfonidis (2006) emphasized that the level of inventory has a direct effect on the profitability of firms. Similarly, the level of receivables (average collection period) can also influence the profitability of firms as posited by Raheman, *et al*, (2010). Therefore since the operating cycle stands for the combination of inventories and receivables, if both ICP and ACP are found to influence profitability in this study, then it can be inferred that OC too influences profitability. This position is maintained by Nobanee and Al-Hajjar (2012).

2.4.4 Other Current Assets to Total Assets Ratio (OCATAR) and Profitability

Naturally, the current assets of any business comprise items such as stocks and inventories, receivables, cash in hand, cash at bank, debtors and prepayments. While,

the total assets refers to the combination of both current and fixed assets (items such as plants and machinery, furniture, fixtures, fittings, motor vehicles and so on). The other current assets to total assets ratio (OCATAR) referred to in this study are current assets minus inventory and receivables to total assets ratio. The basis for employing this variable is to measure its (other current assets') impact on profitability, as the impact of inventory and receivables are covered by ICP and ACP respectively. By extention, these together, ICP, ACP, and OCATAR measure the influence of all current assets to firm profitability. Raheman *et al* (2010) asserted that all the individual components of working capital management and marketable securities play a vital role in the performance of any firm.

However, in line with above, Nor Edi and Noriza (2010) employed the current asset to total asset ratio (CATAR) along with all the components of the cash conversion cycle and other relevant ratios to measure working capital management in relation the performance of 172 listed companies from Bursa Malaysia Main Board. They studied market valuation of performance. Findings from the study, shows a positive significant relationship between the current asset to total asset ratio (CATAR) and the Tobin Q market valuation of firm performance. Based on this finding, it suggests that a higher CATAR has greater chances of higher market valuation. This pre-supposes that a flexible working capital investment policy is preferred in this context.

Similarly, Afza and Nazir (2007) used current asset to total asset ratio (CATAR) to measure the extent of investment in working capital (or current assets). The study investigated the relationship between working capital investments policies

(flexible or restrictive) for seventeen industrial groups of companies listed at Karachi Stock Exchange, Pakistan, for period covering 1998-2003. The results signify that each industry maintained its own different levels of CATAR or investment in working capital.

2.4.5 Average Payment Period and Profitability

The average payment period is used as a proxy for accounts payable. Numerous empirical studies have been conducted in different parts of the world, which utilized the average payment period as a proxy for accounts payable in the relationship between working capital management and profitability (for example, Deloof 2003; Padachi 2006; Raheman & Nasr, 2007; Uyar, 2009; Banos-Caballero, Garcia-Terual, & Martinez-Solano, 2010; Biasis & Gollier, 1997; Mathuva, 2010).

Furthermore, most of these studies found a positive relationship between the average payment period and profitability denoting that the longer or lengthier the average payment period the higher the profitability in line with the traditional view point of financial management that accounts payable be delayed, and receivables be hastened up.

Furthermore, among those prominent studies is the study of Dong and Su (2010). The findings of the study revealed that there was a positive association between profitability and the average payment period. Similarly, Raheman, *et al* (2010) found a positive association between profitability and average payment period. The positive association depicts that the longer the APP, the greater the the profitability and vice-versa. This is based on the fact that by delaying payments to

creditors, the cash could be re-invested or transacted more times to generate more returns and hence more profitability. Therefore, in line with forgone discussion on the average payment period, this study seek to employ this explanatory variable in the current study since it is naturally a partial component of the cash conversion cycle that is used to measure working capital management and also to investigate the impact the variable on the profitability of manufacturing companies listed on the Nigerian Stock Exchange.

2.4.6 Other Current Liabilities to Total Asset Ratio (CLTAR) and Profitability

Other current liabilities to total assets ratio refers to current liabilities minus payables divided by total assets. While the total assets as explained earlier, consists of both the current assets and fixed assets. The OCLTAR is considered very vital in this study, in view of the fact that working capital management or short-term financial management is concerned primarily with decisions relating to current assets and current liabilities (Prasana, 2000). It is employed to measure the influence of the current liabilities, other than payables as it is covered by APP on the profitability of manufacturing firms listed on the Nigerian stock exchange. The current liabilities to total asset ratio (CLTAR) was used as an independent variable in studies such as Nor Edi and Noriza (2010) as well as Afza and Nazir (2007).

However, when employed in the study involving 172 listed companies on the main board of Bahasa Malaysia, Nor Edi and Noriza (2010) found a negative significant relationship between CLTAR and Tobin Q which was used to measure market valuation on firm performance. It signifies that a lower CLTAR results in

higher Tobin Q, which means lower CLTAR enhances a firm's market value of performance and vice-versa, i.e higher CLTAR reduces the firm's market value of performance. Furthermore, Afza and Nazir (2007) employed CLTAR in order to determine the effective financing policy – (conservative or aggressive) that is, utilizing lower levels of current liabilities compared to long-term debt or otherwise.

2.5 An Overview of Nigeria

For the purpose of this study, which centers on the manufacturing companies listed on the Nigerian Stock Exchange, it is deemed imperative that an overview of Nigeria as a country be given, in order to have a clear picture of the rest of the discussions that follows.

According to the federal office of statistics of Nigeria (2010), the federal republic of Nigeria with an area of 923, 769 square kilometers (made up of 909, 890 square kilometers of land and 13, 879 square kilometers of water area) is situated between $3^0$and 14^0 East longitude and $4^0$and 14^0 North latitude. The longest distance from East to West is about 767 kilometers, and from North to South 1,605 kilometers. The country is situated in West Africa and bordered on the West by the Republics of Benin and Niger; on the East by the Republic of Cameroon, on the North by Niger and Chad on the South by the Gulf of Guinea.

Nigeria's capital city is Abuja. According to the bulletin of national population commission (2007), the National Population Commission 2006 census figure, the population stood at 140,431,790 but currently based on the world bank 2011 estimate, the population stood at 162,470,737 and therefore ranked the most

populous African country and 7th most populous in the world. Nigeria's official language is English. The system of government is federation, and has a Presidential system. Nigeria was colonized by Britain and got its independence on October, 1st, 1960. The three largest and most influential ethnic groups are the Hausas, the Yoruba and the Igbos. 55% of the total population are Muslims, 43% are Christians and 2% representing others.

Nigeria occupies an important position in Africa. It has the largest economy in West Africa and the third largest in Africa. Also considering the problems associated with Nigerian manufacturing sector as highlighted earlier, the study of working capital management impact on the profitability of manufacturing companies listed on the Nigerian Stock Exchange is not only strategic but timely. Similar studies were conducted in different parts of the world which make this current study an addition to series of literature and body of knowledge. For example Afza and Nazir (2007) conducted similar study in Pakistan, Mathuva (2010) in Kenya, Deloof (2003) in Belgium and Gill, *et al* (2010) in the USA. In all those studies working capital management was measured with CCC and (its components) and its relation to profitability was investigated. The current study will add impetus in this direction.

2.5.1 Nigerian Economy

Nigeria`s economy could be described as a middle income, mixed economy with potentials for expanding financial, service, communication and entertainment sectors. According to Federal Office of Statistics, Nigeria is ranked 30th in the world in terms of GDP (PPP) as of 2011. According to the National Bureau of Statistics

released through the Federal Office of Statistics, the Nigerian GDP at purchasing power parity (PPP) stood at $413.4 billion in 2011, which was far higher than what was obtained in 2005 i.e. $170.7 billion.

According to Molem (1997) oil revenues constitutes over 92% of the total foreign exchange earner. But ironically it accounts for less than 14% of the GDP. This signifies that, though the petroleum sector is important, it remains a small part of the country`s overall vibrant and diversified economy. Although Nigeria`s anticipated revenue from oil in 2011 was about $52.2 billion, over 57% of the population are in abject poverty. The main source of this unfortunate situation is corruption (Ajibade, 2010; Molem, 1997). In fact, the World Bank has estimated that as a result of corruption 80% of energy revenues benefit only 1% of the population.

The table below summarizes the major economic indicators, vital data, and facts of the Nigerian economy based on what was obtained against specific years:

Table 2.1
Summary of Major Economic Indicators and Nigerian Vital Data

ITEM	DETAILS
GDP: Purchasing power parity	$ 459.4 billion (2009 estimate)
GDP – real growth rate	7.14% (2010 estimate)
GDP- per capita: PPP	$ 3,460 (2009 estimate)
Composition by sector:	
Agriculture	26.8%
Industry	48.8%
Service	24.4%
Population below poverty line	54.98% (2009 estimate)
Inflation rate (Consumer price)	12.3% (2011 estimate)
Labor force	57. 21 million
Labor force- by sector	Agriculture 70%, industry 10 %, Service 20% (2009 estimate)
Unemployment rate	24% NA (2010 estimate)
Industries	Crude oil, coal, columbine, palm oil, peanuts, cotton, rubber, wood hides and skin, textiles, cement and other construction materials, food products, footwear, chemicals, fertilizer, printing, ceramics, and steel.
Industrial production growth rate	4.7% (2010 estimate)
Electricity-Production by source:	fossil fuel: 61.60% Hydro: 38. 31% Nuclear: 0% Others: < .1% (2009 estimate)
Oil Production	2.4 million barrels per day (January 2013 timate)
Agricultural products	Cocoa, peanuts, palm oil, maize, rice, sorghum, millet, cassava (tapioca), yams, rice, rubber, cattle, sheep, goats, pigs, timber, fish.

***Source**: Federal Office of Statistics, under the National Bureau of Statistics, 2010, and Nigerian National Petroleum Corporation (NNPC) release, January, 2013.*

However, among all the economic sectors discussed earlier the most significant one remains the manufacturing as far as this study is concerned. This therefore, draw us to Nigerian manufacturing sector, which constitutes up to 22% of the total 48.8% of the total industries from the table, this leads us to the manufacturing companies whose performance will later be analysed.

2.5.2 Nigerian Manufacturing Sector

Although manufacturing is usually a small sector in African economies in terms of share of total output or employment, growth of this sector has long been considered crucial for economic development, this special interest in manufacturing stems from the belief that the sector is a potential engine of modernization, a creator of skilled jobs, and a generator of positive spillover effect (Tybouts, 2000).

According to Mike (2010), manufacturing remains one of the most powerful engines for economic growth, it acts as a catalyst to transform the economic structure of countries, from simple, slow growing and low-value activities to more productive activities that enjoy greater margins, are driven by technology, and have higher growth prospects. But its potential benefits are even greater today. With rapid technological change, sweeping liberalization and increased defragmentation and internalization of production, manufacturing has become the main means for developing countries to benefit from globalization and bridge the income gap with the industrialized world. These are some of the many arguments that justify the importance of promoting manufacturing in the developing world (Haranji, 2013).

Furthermore, according to the Bureau of Public Enterprise (BPE) (2006), players in the Nigerian Industrial and Manufacturing sector can be classified into four groups, multinational, national, regional and local. However, the Manufacturers Association of Nigeria has categorized its industries into large, medium, and small scales in line with the national council of industries (NCI) classification.

According to MAN, SON (Standard Organization of Nigeria) and RMRDC (Raw Materials Research and Development Council), the following product sectorial groups exist in Nigeria: Food; beverages and tobacco; chemicals and pharmaceuticals; domestic and industrial plastic and rubber; basic metal; iron and steel and fabricated metal products; pulp, paper and paper products; printing and publishing; electrical and electronics; textile; wearing apparel; carpet, leather and footwear; wood and wood products, including furniture; non-metallic mineral products; motor vehicle and miscellaneous assembly.

2.5.3 Problems and Challenges of the Nigerian Manufacturing Sector

Before venturing into this analogy, it is vital to appreciate the fact that the perspective of manufacturing companies in Nigeria differ from that of its counterparts in advanced countries, particularly the West. While manufacturing industries in the advanced countries aims at generating, accumulating and reproducing capital, most of Nigerian manufacturing industries are premised on import- substitution.

In achieving the latter objective, industrial equipment and raw materials are transported into Nigeria, installed and used for routine production activities, either by multinational corporations, or other industries. Consequently Nigeria`s manufacturing industries find it difficult to revolutionize production (Mike, 2010). Another important constraint is the fact that, the manufacturing firms lack sophistication, i.e. they consist of largely a handful of firms producing mainly

construction materials, clothing, textiles, footwear, as well as processed foods using simple assembly processes.

Furthermore, according to Mike (2010), Nigeria`s manufacturing firms in terms of engine and machinery, consist mainly of assembly plants only with little impact in the economy, since most of the inputs are imported. He emphasized that, another major setback is the lack of raw materials. The crisis experienced in 2009 in the flour mill industry in Nigeria typifies this scenario.

Another important issue, according to Mike (2010) is the problem of feeder industries, this is clearly demonstrated by the difficulties faced by Nigeria's automobile industry as a result of some omissions in the policy establishing the country's iron and steel project. Although the Nigerian iron and steel industries are programmed to produce a mix of finished products, it was later realized that the program did not include the production of sheet metal, an important component of the vehicle assembly industry. The implication of this singular omission for Nigeria is technological dependence through continued importation of parts for vehicle assembly. Consequently, the technological manpower in the automobile industry will continue to perform routine assembly tasks.

According to the Manufacturers Association of Nigeria (2011), about 80% of Nigerian PhDs are employed in universities, 16% in government research institutes, while an insignificant 4% are distributed in the civil service and industry with minimal linkage between the research and development units of industries and the core researchers. Researches on the use of local materials which should typically be undertaken by research and development (R&D) department in collaboration with

scholars, philosophers, scientists and their respective institutions is basically an ignored practice.

The implication of this lopsided distribution and poor linkage is not far-fetched. According to Soderbom and Teal (2011), in a report by the United Nations Industrial Development Organization (UNIDO) and the Centre for Study of African Economics of the University of Oxford, it was observed and reported that the key to reversing the poor performance of the Nigerian Manufacturing is an increase in firm level efficiency. Furthermore in another report by UNIDO published in THISDAY Newspapers of Saturday, 27 October (2012), the world body reported a decline in the growth of manufacturing sector in Nigeria and other developing countries. The report stressed that manufacturing output in the countries dropped to the lowest level since the beginning of 2011. The report predicted a further slow in growth of the manufacturing value added (MVA) in Nigeria to 4.5 per cent in 2013.

2.5.4 Nigerian Stock Exchange

According to the Nigerian Stock Exchange (NSE) FACTBOOK (2012), NSE was established in 1960 as Lagos Stock Exchange. As of December, 31, 2012 it had about 198 listed companies with a total market capitalization of about ₦8.9 trillion ($57 billion). All listings are included in the Nigerian stock exchange all share index. The NSE started operations in Lagos in 1961 with securities listed for trading. In December 1977 it became known as the Nigerian Stock Exchange, with branches established in some of the major commercial cities of the country. With about 200 companies and 258 securities listed, the exchange operates a fair, orderly and

transparent market that brings together the best of African enterprises and the local and global investor communities.

The Nigerian Stock Exchange is regulated by the Securities and Exchange Commission (SEC) which has the mandate of surveillance over the exchange to forestall breaches of market rules, detect and deter unfair manipulations and trading practices. The exchange has an automated trading system. Data on listed companies` performances are published daily, weekly, monthly, quarterly and annually. The NSE has been operating an automated trading system (ATS) since April 27, 1991, with dealers trading through a network of computers connected to a server. The ATS has facility to access trading and surveillance. Trading on the exchange starts at 9.30 am every business day and closes 2.30pm.

Accordingly, for the purpose of encouraging foreign investment into Nigeria, foreign brokers are allowed to enlist as dealers on the Nigerian Stock Exchange, thereby allowing investors of any nationality to freely invest. Nigerian companies are equally allowed multiple and cross border listings on foreign markets.

Additionally, the Nigerian Stock Exchange is a member of the world federation of exchanges (FIBV). It is also an observer at meetings of international organization of securities commissions (IOSCO), and a foundation member of the African Stock Exchange Association (ASEA). The national council serves as the governing body of the Nigerian Stock Exchange. Currently it has eighteen members, comprising eleven individual ordinary members and seven dealing members. The council directs the financial affairs, business, strategy, structures and policies, monitors the exercise of

any delegated authority and deals with challenges and issues relating to corporate governance, corporate social responsibility and corporate ethics.

2.5.5 Listings on NSE and the Requirements

According to the operations and investment department of Securities and Exchange Commission (2012), listing on the Nigerian Stock Exchange is primarily done through the main board. This main board features shares of large (e.g. blue chip) companies. Issuers admitted to this board can access an unlimited amount in funds from the public. The three important criteria for admission are as follows:

- At least 20% of shares capital must be offered to the public (secondary dual listings require that at least 10% of share capital to the Nigerian Public).
- The number of shareholders of the company must not be less than 300.
- The issuer is required to pay an annual listing fee based on market capitalization.

This board features companies operating in 12 industry sectors: agriculture, construction/real estate, consumer goods, financial services, healthcare, industrial goods, information and communication technology (ICT), natural resources, oil and gas, services, utilities and conglomerates. The manufacturing companies that are of more interest to this study are fished out from these 12 industry sectors, totaling 55 in number.

However, the requirements for listing on the main Board are as follows:

- The company must be registered as a public limited company under the provisions of the Companies and Allied Matters Act, 2004.
- The company must submit accounts (financial statements) for 3 years prior.
- The date of the company`s last audited accounts (financial statements) must not exceed 9 months.
- The amount of capital that can be raised from the public is not limited, depending on the borrowing power of the directors.
- Annual listing fees are based on market capitalization
- At least 20% of the share capital must be offered to the public.
- Number of shareholders must not be less than 300
- After listings, the company must submit quarterly, half-yearly and annual accounts (financial statements).
- Securities must be fully paid at the time of allotment.

In view of the forgone discussions on Nigeria which is the environment of this study, particularly looking at its population, size of its economy and the position it occupies in African region and considering the problems and challenges of its manufacturing sector, the choice of studying the impact of working capital management and profitability on manufacturing companies listed on Nigerian Stock Exchange is in

the right direction. Nigeria is currently more strategic for this type of study than other smaller African countries like Liberia, Niger, Cameroon or Togo.

2.6 Linkages to other Chapters

This Chapter Two is dedicated to the extensive review of the literature related to this study. It is the explanatory chapter of the study. It elaborated more on the issues raised in chapter one particularly with respect to problem statement and the background of the study. However, now that contextual issues of the study have been discussed, the next chapter (chapter three) focuses on the appropriate methodology which the study uses in carrying out this research. In line with that, the framework of the research is explained in relation to the conceptual underpinning which is followed by discussion on the issues relating to population of the study, sampling, data collection methods and techniques of its analysis. The chapter that follows afterwards is dedicated to issues of data presentation, analysis and interpretation. The final chapter is about the summary, conclusion, and the possible recommendation.

2.7 Summary of the Chapter

The final item to be treated in this chapter is its summary. The chapter started with the issues of working capital management and was followed by a discussion on the related concepts and theories. The next item discussed was the relevant empirical studies relating to working capital management and profitability including all the explanatory variables of the study. Finally, the environment of the study (Nigeria)

was explored which centered on the Nigerian economy, the manufacturing sector and the Nigerian Securities and Exchange Commission were discussed.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

The previous chapter has reviewed the individual components of working capital and the working capital policies of manufacturing firms. Furthermore, a review of all the related literature was undertaken. This third chapter discusses aspects of research methodology that were applied in this study. The chapter begins with conceptual framework of the study which depicts the link between all the explanatory variables and dependent variables of the study. This will be followed by the research hypothesis which emanates from the earlier stated research questions. The chapter will discuss the control variables of the study, as well as the research design. The section that follows then concentrates on operationalization and variables measurement, population and sampling, method of data collection and analysis as well as the model specification.

3.2 Conceptual Framework

Reference to Figure 3.1, the study employed five independent variables namely; average collection period, inventory conversion period, and average payment period, these three as partial components of the cash conversion cycle. The other two are the other current asset to total asset ratio and the other current liability to total asset ratio. The operating cycle will serve as another variable in the study.

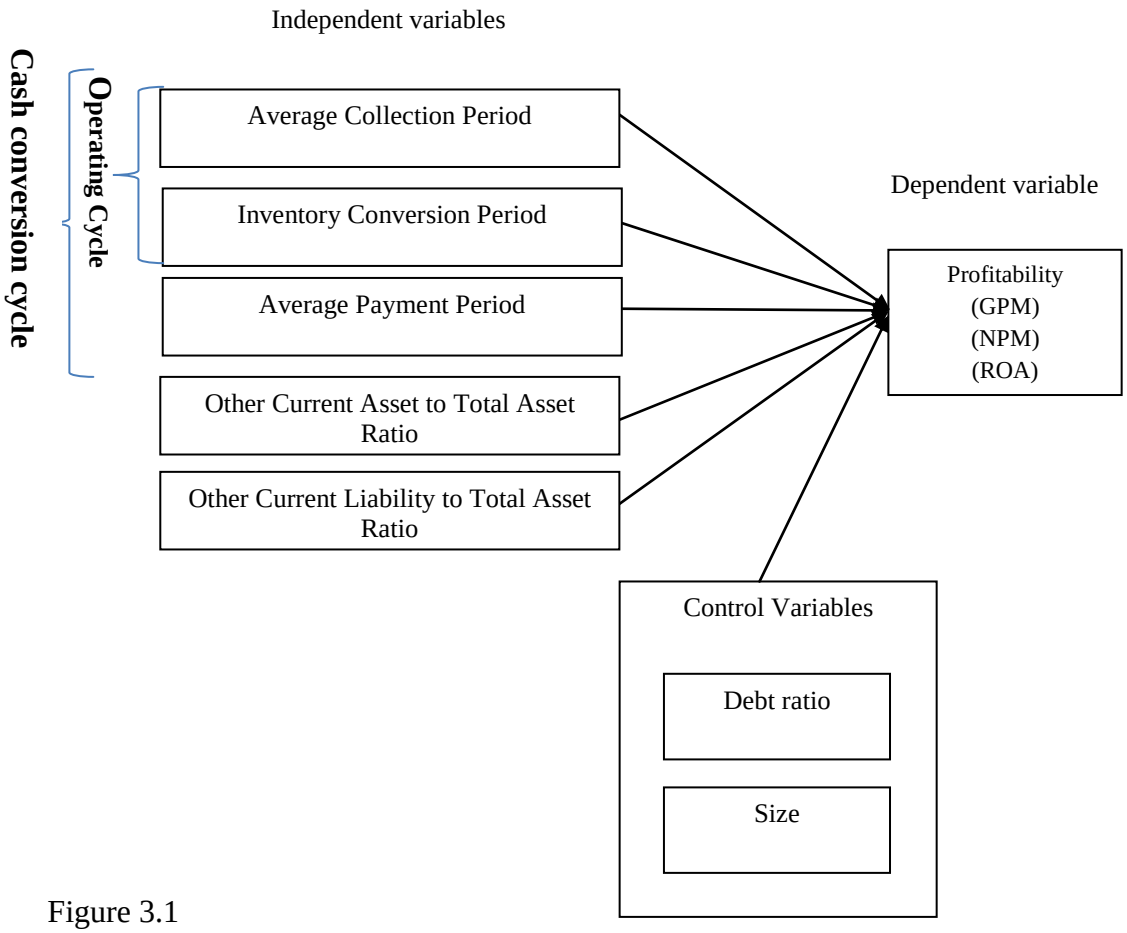

Figure 3.1
Conceptual Framework

3.2.1 Research Hypotheses

In line with research question and the conceptual framework as well as the objectives of the study the following hypothesis are advanced.

Hypothesis 1: There is a significant relationship between inventory conversion period and profitability.

Hypothesis 2: There is a significant relationship between average collection period and profitability.

Hypothesis 3: There is a significant relationship between operating cycle and profitability.

Hypothesis 4: There is a significant relationship between other current assets to total assets ratio and profitability.

Hypothesis 5: There is a significant relationship between average payment period and profitability.

Hypothesis 6: There is a significant relationship between other current liabilities to total asset ratio and profitability.

Hypothesis 7: There is significant relationship between cash conversion cycle and profitability.

3.2.2 Variables Linkage with Underlying Theories (Theoretical Underpinnings)

Basically two fundamental theories were used to explain the relationships among the variables of the framework in this study. The essence of using theoretical underpinnings in explaining relationships among the variables is to give a true guide, appropriate logical inference, solid philosophical base and proper understanding of the study and potential contribution the study intends to make to the body of knowledge. The two theories are the risk and return theory and the resource-based theory.

The operating cycle was employed as a concept in this model to look at one side of working capital, i.e., that of current asset account and firm`s operating activities with respect to production, distribution and collection. For instance, receivables are directly affected by the credit collection policy of a firm and the

number of times receivables are converted into cash in a year matters a lot in working capital management. This therefore seeks to explain the links between operating cycle and profitability in the framework. This concept was employed by Falope and Ajilore (2009) to measure working capital management. Cash conversion cycle concept is also employed in the model. The CCC integrates three components of inventories, receivables and the payables represented by the inventory conversion period, average collection period and the average payment period which are three independent variables in the frame work. It integrates all the dimensions in the framework and both sides of working capital i.e. both current assets and current liabilities. The concept is therefore employed to explain the relationship between the individual dimensions of cash conversion cycle and profitability of firms. This is consistent with earlier studies of Falope and Ajilore (2009), and Alipour (2011).

The theory of risk and return is the next theory employed by this study. In accordance with the theory of risk and return, investments with higher risk are likely to have a higher return and vice-versa. Thus, a firm with a higher level of working capital liquidity will have low risk to meet its obligations but will have low profitability at the same time (Karaduman, et al, 2010). Undoubtedly this theory is very vital in the context of this study because the central theme in working capital management lies in the trade-off between profitability and liquidity in the management of working capital as highlighted earlier in both chapters one and two of this study. Therefore the theory of risk and return helped in explaining the relationship between profitability and liquidity and the choice between the two

conflicting decisions in working capital management. The choice of liquidity over profitability means excess current assets which is not return yielding and thus reduces profitability. On the other hand, lack of liquidity results in inability to make payments and disruptions of operations. The theory was used in the studies of Garcia-Terual and Martinez-Solano (2007), Zariyawati *et al* (2009) and Karaduman, *et al* (2010).

Finally, the study also employed resource-based theory. Resources are the basis of business survival and corporate profitability they could either be human or material. Resources are inputs in to the production process. The resources of an individual firm include items such as capital equipment, patents, brand names, the skill associated with individual employees, finance and so on. Any productive activity must require the co-operation and co-ordination of teams of resources. Therefore, resource-based theory is employed in this study to include the individual managers of business as human resource in ensuring effective management of short-term assets of business (working capital). This implies that managers have specific resources that facilitates and ensures the recognition of new opportunities, effective assembling of resources as well as making payments and recovering of receivables. Also this theory has been used in explaining size which was used as a proxy for resources. It shows that larger companies may have more resources at their disposal and this could potentially be used to increase their profitability. And so, size is used as a control variable in the model to control for the influence of size (resources) and profitability. Having linked the variables in the framework with the theoretical underpinnings, the next section dwells into the design of the research.

3.3 Research Design

Having identified the variables of the study and developed the theoretical framework, and linked the theoretical underpinnings, the next step is to explain the design of the research in such a way that the requisite data can be gathered and analyzed to arrive at a solution (Sekaran & Bougie, 2009). Research design is the science (and art) of planning procedures for conducting studies, so as to get the most valid findings (Vogt, 1993). It is therefore at this stage of the research method which constitutes the best way of gathering data is designed. In line with this, studies may be either exploratory in nature or descriptive. It may be conducted to test hypothesis or in form of a case-study. Accordingly, the current study was designed as descriptive since it involves numerical computations and making inference on the results obtained.

3.4 Control Variables

Control variables are those variables included in a model equation whose effects need to be controlled in the model. They are simply certain conditions or criteria, that when they are not accounted for, will either invalidate the findings of the study or make it quite unrealistic because of the effect it will have on the profitability which is the dependent variable of the study.

Control variables are therefore very essential considerations when secondary data or analysis of firm indices is concerned. In view of this therefore, this study controls for debt and size of companies. This is consistent with several previous studies (such as Deloof, 2003; Lazaridis & Tryfonidis, 2006; Alipour, 2011;

Raheman et al, 2010; Dong & Su, 2010 and Falope & Ajilore, 2009). Furthermore, apart from the control variables, this study comprehensively operationalized and measured all the dependent and independent variables.

3.5 Operationalization and Measurement of Variables

The dependent and all the independent variables as well as the control variables of the study will be measured as below:

Table 3.1
Measurement of Variables and Abbreviation

Variable (Proxy)	Measurement	Abbreviation
Gross Profit margin	$\frac{\text{Gross profit}}{\text{Net sales}}$	GPM
Net profit margin	$\frac{\text{Net profit}}{\text{Net sales}}$	NPM
Return on Assets	$\frac{\text{Net Profit}}{\text{Total assets}}$	ROA
Inventory Conversion Period	$\frac{\text{Inventory}}{\text{Cost of goods sold}} \times 365$	ICP
Average Collection Period	$\frac{\text{Account receivable}}{\text{Net sales}} \times 365$	ACP
Operating Cycle	ACP+ ICP	OC
Other Current Assets to Total Assets Ratio	$\frac{\text{Current assets-Account receivable-Iv}}{\text{Total assets}}$	OCATAR
Average Payment Period	$\frac{\text{Account payables}}{\text{Purchase}} \times 365$	APP
Other Current Liabilities to Total Assets Ratio	$\frac{\text{Current liabilities-Account Payables}}{\text{Total assets}}$	OCLTAR
Cash Conversion Cycle	ACP+ICP-APP	CCC
Debt Ratio	$\frac{\text{Total debts}}{\text{Total assets}}$	DR
Size of Company	Natural logarithm of sales	SIZE

Iv refers to inventory.

After operationalization and measurement of variables, we therefore seek to establish the population as well as the sampling design of this study.

3.6 Population and Sampling Design

In this section of the chapter, population of the study is established and then highlighted, the issues of sampling, sampling process are also presented and the sample frame is identified.

3.6.1 Defining the Population

It is considered important that the population is meticulously defined before the sample design is considered. The use of the word "population" in the sampling context is different from its general usage. A population refers to "the entire group of persons (or institutions, events, or the subjects of the study) that one wishes to describe or about which one wishes to generalize" (Vogt, 1993). Similarly, Sekaran and Bougie (2009) defined population as the entire group of people, events or things of interest that the researcher wishes to investigate. It is the group, events or things of interest that the researcher wants to make inferences (based on sample statistics). For this study, the population comprised all the manufacturing companies listed on the floor of Nigerian Stock Exchange (NSE) totaling 55.

In Nigeria, firms, businesses or companies register with the various regulatory bodies or agencies some of which includes the Corporate Affairs Commission (CAC), the small and medium scale business development commission, the patent and trademark division of the federal ministry of commerce and of course, the Nigerian Stock Exchange (NSE) as the apex. There are criteria for listing a company on the Nigerian Stock Exchange as discussed earlier. However, in reality and practical terms, it is perceived as relatively difficult to get the full data required

to compute all the indices of measurements and related ratios highlighted from all the 55 manufacturing companies listed on the Nigerian Stock Exchange, this is principally due to the possibility of having a missing data from the financial statements provided and partly due to the peculiarity of data (financial) in a developing and rather rudimentary stock exchange, like Nigeria. Hence, the study needs to identify a specific listing of the members of the population that can be the basis of the research. The table below present the break-down of companies listed on Nigerian Stock Exchange (NSE) by sectors.

Table 3.2
List of total number of companies listed on NSE by sectors

Sector	**No. of Companies**	**Percentage**
Financial services	54	26.73
Conglomerates	5	2.48
Construction/real estates	12	5.94
Manufacturing	55	27.23
ICT	12	5.94
Health Care	20	9.90
Agriculture	5	2.48
Natural Resources	4	1.98
Oil and Gas	14	6.93
Services	21	10.40
TOTAL	**202**	**100**

3.6.2 Sampling Process

A sample itself is defined as a group or subset of the population. It comprises some members selected from it. By, studying the sample, the researcher should be able to draw conclusions that are generalizable to the population of interest (Sekaran & Bougie, 2009). In line with this, therefore, Sekaran (2004) defines sampling as the process of selecting a sufficient number of elements from the population, so that by

studying the sample and understanding the properties or the characteristics of the sample subjects, it would be possible to generalize the properties or characteristics to the population elements. The rationale behind sampling is that, not only does it save time and money, but it is also more efficient and precise in conducting studies on a population (Fink, 1995). This study adopted some of the steps outlined by Churchill and Iacobucci (2002) and Davis and Cosenza (1993) in drawing a representative sample of the population, which was also in line with Zainudin (2009).

3.6.3 Sample Frame

A sample frame is a list or set of directions that identify all the sample units in the population (Alreck & Settle, 1995). Similarly, Cavana et al (2001) defines the sampling frame as a listing of all the elements in the population from which the sample is drawn. Selection of the frame is a critical step in the sampling process. Under normal circumstance the list should include all or almost all the members of the population either individually or in form of grouping. Therefore, to enable a legitimate generalization of the results of the study, the sampling frame should be representative of the population (Fink, 1995).

Therefore with reference to this study, the sampling frame, comprised all the 55 manufacturing companies listed on the Nigerian Stock Exchange of which the list was obtained from the headquarters of the Securities and Exchange Commission (SEC) a regulatory arm of Nigerian Stock Exchange (NSE), situated at SEC towers, plot 272 & 273, Samuel Adesujo Ademulegun Street, Central Business District, Abuja, Nigeria as at November 2012, under the sub-sectorial classification of the

manufacturing sector. It should however be stressed here that all the manufacturing companies listed or to be listed after December 2012 are excluded from this sample frame in view of the fact that the study covered financial years range 2008 through to 2012. The table 3.2 below shows the breakdown of 55 manufacturing companies listed of the Nigerian Stock Exchange, grouped into sub-sectors:

Table 3.3
Manufacturing Companies Break-Down by Sub-Sectors

Manufacturing Sub-sector	**Number**	**Percent**
Food, beverages and tobacco	18	32.73
Chemical and pharmaceuticals	16	29.10
Domestic and industrial plastic and rubber	6	10.91
Basic metals, iron and steel	3	5.45
Pulp paper and Paper Products	1	1.82
Electrical and Electronics	2	3.64
Textile	2	3.64
Leather and footwear	4	7.27
Wood and wood products	2	3.64
Motor vehicles and miscellaneous assembly	1	1.82
Total	55	100

3.6.4 Sample Design

The sample design is an approach used in selecting the units of analysis for the study (Davis & Cosenza, 1993). The types of non-probability sampling are convenience and purposive sampling. For the sake of this study, all the 55 manufacturing companies listed on the Nigerian Stock Exchange were chosen as sample in line with convenient sampling.

3.6.5 Determining the Sample Size

Determining the number of the sample or its size is the next step. Sample size refers to the number of units that needs to be surveyed to get precise and reliable findings (Finks, 1995). In determining the sample size, many authors have discussed at length several approaches that can be employed (Cavana et al, 2001; Churchill Jr & Iacobucci, 2002; Sekaran, 2004). In relation to this therefore, Sekaran (2004) suggested a rule of thumb for determining sample size, that, sample size larger than 30 and less than 500 are appropriate for most research. Considering the issue of availability of required data and lack of detailed requirement by the Companies and Allied Matters Act (CAMA) 1990 on the actual financial information required by the companies and how detailed it should be coupled with the contacts made through the security and exchange commission, the total population of the study was determined to be the entire manufacturing companies totaling 55 were taken as a sample, although data collected and analyzed was in respect of 53 companies. The data for 2 companies was not readily available.

3.6.6 Unit of Analysis

Unit of analysis refers to the level of aggregation of the data collected during the subsequent data analysis stage (Sekaran, & Bougie, 2009). Determination of unit of analysis for a given study is reflected from both problem statement and the research questions raised. Therefore, for this study the unit of analysis is the companies (Manufacturing, listed on the Nigerian Stock Exchange).

3.7 Data Collection Method

Data collection methods are an integral part of research design. There are several data collection methods, each with its advantages and disadvantages. Hence, problems researched with the use of appropriate methods greatly enhance the value of the research (Sekaran & Bougie, 2009). Some of the methods include interviews, use of questionnaire, observation and the use of secondary sources of data. Therefore, for the purpose of this study the secondary source of data was employed.

This study utilized secondary data sources from the annual reports and statements of accounts of the sampled manufacturing companies listed on the Nigerian Stock Exchange, for the period covering 2008-2012. This data was sourced from the FACTBOOK, an annual publication of the Nigerian Stock Exchange (NSE). The study used the data extracted from the annual financial statements relevant to the variables of the study for the five year study period. The five year study period was considered sufficient to make an important inference on phenomena under study. Meric, Prober, Eichhorn, and Meric (2004) states that averages for longer period, say 10 years or more, will reflect some company characteristics that prevailed long time ago, which may no longer exist. The study will now seek to look at how the data will be analyzed.

3.8 Data Analysis Strategy

This section of the chapter discusses the technique of data analysis that was applied. The discussion will then narrow down to the technique adopted in this study, the stages followed and the model specification. In line with this, statistics texts

commonly draw a distinction between exploratory data analysis and descriptive statistics, which summarizes or displays quantitative data analysis or inferential statistics, which involves using quantitative data collected from a sample to draw conclusions about a population (Hussey & Hussey, 1997).

3.8.1 Univariate Analysis

Univariate analysis is the simplest form of quantitative analysis. The analysis is carried out with the description of a single variable in terms of the applicable unit of analysis. It deals with each variable in a data set separately and looks at range of values as well as describes each variable on its own. For example, frequency distribution, measures of dispersion, central tendency and so on (Emory & Cooper, 1991). The stages of univariate analysis employed in this study include series of computations of the variables of the study. For instance, determining of inventory conversion period, average collection period, average payment period and all the ratios computed.

3.8.2 Bivariate Analysis

Bivariate analysis simply refers to an analysis of two variables. It is used to test association for the purpose of investigating relationship between two variables. The fact remains a univariate analysis is just an initial stage of data analysis process. A bivariate analysis is a step higher because a researcher will probably be interested in the connection between a variable and a number of other variables. However,

relating to this, the current study used correlation analysis to examine relationships between the explanatory variables and the dependent variable.

3.8.3 Multivariate Analysis

Multivariate analysis refers to all statistical techniques that simultaneously analyze multiple measurements on individuals or objects under investigation (Hair, et al, 2010). Thus, any simultaneous analysis of more than two variables can be loosely considered as multivariate analysis. The multivariate analysis can be applied for both predictive as well as exploratory purposes. This study employed panel regressions, fixed effect (FE), random effect (RE) to determine the level of significance among the variables.

Considering the importance of multiple regressions in this study, it is ideal to explain some related terms as they are applicable to the current study. Multiple regression analysis is a statistical technique that can be used to analyze the relationship between a single dependent variable and several independent variables. Multiple regressions are the appropriate method of analysis when the research problem involves a single metric dependent variable (Hair et al, 2010). Some statistical tests relevant to this mode of analysis which helps in explaining relationships between variables explicitly are the adjusted R^2, Durbin-Watson statistics, unstandardized coefficient, and the collinearity statistics.

- **Adjusted R-Square**: This could be explained to mean a denotation that gives a truer estimate of how much the independent variables in a regression analysis explain the dependent variable. The adjustment is made by taking into account

the number of independent variables. The adjusted $R^2$is a measure of strength of association (Vogt, 1993).

- **Durbin-Watson Statistics:** This is simply a test for autocorrelation, or serial correlation in a time-series OLS regression analysis. It is basically a test statistic used to detect the presence of autocorrelation in residuals (prediction errors) from a regression analysis. Note that the distribution of this test statistics does not depend on the estimated regression coefficients and the variance of the errors. It can take a range of values from 0 to 4. It should be 2 if there is no autocorrelation. If it is much lower than 2, then there is a positive serial correlation, and if it is much higher than 2, then there is negative serial correlation (Vogt, 1993; Montgomery, Peck, & Vinning, 2001).

- **Unstandardized Coefficient**: This is the measurement of the number of units of increase in the dependent variable caused by an increase of one unit of independent variable (Huizingh, 2007).

- **The Collinearity Statistics**: These are simply the measures of multicollinearity. That is to say, the extent to which an independent variable can be explained by other variables in the analysis, an increase in multicollinearity, always complicates the interpretation of variant, because it is more difficult to ascertain the effect of any single variable, owing to their interrelationships.

The most widely used approaches to measure the extent of multicollinearity are tolerance statistics and variance inflation factor (VIF).

After exploring, all the analysis stages relevant in processing the secondary data, it is vital to state that the technique or strategy of the analysis used depends on the nature of data and the needed results or outcome, which is equally dependent upon the research questions. Therefore for the sake of this study, the impact of working capital management upon the profitability of manufacturing firms will be tested by panel data methodology.

3.9 Panel Data Methodology

The panel data methodology used has certain benefits, which includes using the basic assumption that companies are heterogeneous, more variability, has less collinearity between variables, has more informative data, has greater degree of freedom and more efficiency (Baltagi, 2001). More so, panel data gives the researcher a large number of data points. It equally allows researcher to construct and test more complicated behavioral models than purely cross-sectional or time series data (Hsiao, 2003). Panel data to a certain degree provides a means of resolving or reducing the effects of the presence of omitted (mis -measured or unobserved) variables that are correlated with explanatory variables. This is done by utilizing information on both inter temporal dynamics and the individuality of the entities being investigated (Hsiao, 2003).

In panel data regression, several cross-sectional units are observed over a period of time. The panel data method of analysis, is considered more useful in

studying the dynamics of adjustments, and is also better able to identify and measure effects that are simply not detectable in pure cross-sectional or pure time-series data (Raheman & Nasr, 2007). Therefore given these advantages, we expect a more reliable estimate. The use of panel data analysis methodology is consistent with studies of Garcia-Terual & Martinez-Solano (2007), Falope & Ajilore (2009) and Raheman *et al* (2010).

Panel data estimation is most often considered as an efficient analytical method in handling econometric data. In recent times, analysis of panel data has continued to become popular among social scientists. This is so, because it permits data inclusion for N cross-sections (for example, households, individuals, firms, or countries) and T time periods (for instance, a month, a quarter or a year). The panel data matrix set combined, consists of a time series of each cross–sectional member data contained in the data set, and offers also a variety of methods of estimation.

A data set that constitutes only of observations of individual N, at a same point in time is known as a cross section dataset. However, where a panel has same number of time observations relating to every variable and in all individuals, it is then referred to as a balanced panel. Panel data (also known as longitudinal or cross-sectional time series data) is a data set in which the behaviours of entries are observed across time. These entries could be states, companies, individuals, countries and a host of others.

Panel data allows you to control for variables you cannot observe or measure like cultural factors or difference in business practices across companies; or variables that change overtime but not across entities (for example, national policies, federal

regulations, international agreements) this is, it accounts for individual heterogeneity. Some drawbacks are data collection issues (sample design, coverage), non-response in the case of micro panels or cross- country dependency in the case of macro panels (i.e. correlation between countries) as presented by Hsiao (2003).

Panel data are either pooled, run with fixed effects or with random effects. Therefore, for the purpose of this study the data was run with both fixed effects and the random effects estimation techniques and were subsequently followed by the Hausman test. The subsequent paragraphs highlights on the fixed and random effects and the Hausman test.

3.9.1 Fixed Effects Model

The STATA command to run fixed / random effect is “xtreg”, before using xtreg command STATA is set to handle panel data by using the command xtset. Fixed effects (FE) is used whenever the interest is on analyzing the impact of variables that vary overtime.

FE explores the relationship between predictor and outcome variables within an entity (country, person, company). Each entity has its own individual characteristics that may or may not influence the predictor variables. When using FE we assume that something within the individual may impact or bias the predictor or outcome variables and we need to control for this. This is the rationale behind the assumption of the correlation between entity`s error term and predictor variables. FE remove the effect of those time-invariant characteristics from the predictor variables so we can access the predictor`s net effect.

Another important assumption of the FE model is that those time-invariant characteristics are unique to the individual and should not be correlated with other individual characteristics. Each entity is different, therefore the entity`s error term and the constant (which captures individual characteristics) should not be correlated with the others. If the error terms are correlated then FE is not suitable since inferences may not be correct and the relationship needs to be modeled (probably using random effects), this is one main rationale for the Hausman test.

The equation for the fixed effects model becomes:

$$Y_{it} = \beta_i X_{it} + \alpha_i + \mu_{it} \quad (1)$$

Where

- α_i (i = 1 …… n) is the unknown intercept for each entity
- Y_{it} is the dependent variable (DV) where i = entity and t = time.
- β_i is the coefficient for a given independent variable $(IV)_i$
- μ_{it} is the error term.
- X_{it} is the independent variable (IV), where I = entity and t = time.

It is worthy to note that "the key insight is that if the unobserved variable does not change overtime, then any changes in the dependent variable must be due to influences other than these fixed characteristics (Stock & Watson, 2007). Another way to see the effects model is by using binary variables. So the equation for the effect becomes:

$$Y_{it} = \beta_0 + \beta_i X_{it} + \ldots\ldots\ldots + \beta_k X_{it} + Y_2 E_2 + \ldots\ldots\ldots + Y_n E_n + \mu_{it} \ldots\ldots\ldots \text{(eq. 2)}$$

Where

Y_{it} is the dependent variable (DV) where i = entity and t = time

$X_{it,}$ it represents independent variables (IV)

B_k is the coefficient for the IVs

μ_{it} is the error term

E_n is the entity n, since they are binary (dummies) Y_n E_n entities included in the model.

Y_2 is the coefficient for the binary repressors (entities) and E_2 is the entity.

Both equations 1 and 2 are equivalents.

Conclusively, the fixed model controls for all time-invariant differences between the individuals, so the estimated coefficients of the fixed-effects models cannot be biased because of omitted time-invariant characteristics. (like culture, religion, gender, race).

One side effect of the features of fixed effects model is that they cannot be used to investigate time-invariant causes of the dependent variables. Technically, time-invariant characteristics of the individual entities are perfectly collinear with the entity dummies. Substantially, fixed effects models are designed to study the causes of changes within an entity. A time invariant characteristic cannot cause such a change, because it is constant for each entity.

It is possible in some instances to extend the fixed effect model by including a set of time dummies as well. This is known as two-way fixed effect model, and it has the further advantage of capturing any effects which vary overtime but are common across the whole panel. The fixed effect model is a very useful basic model to start from, however, traditionally, panel data estimation has been mainly applied

to datasets where N is very large and in this case a simplifying assumption is sometimes made which gives rise to the random effect model.

3.9.2 Random-Effect Model

The random effect model is also called random intercepts or partial pooling model. The rationale behind random effects model is that, unlike the fixed effects model, the variation across entities is assumed to be random and uncorrelated with the predictor or independent variables included in the model. The crucial distinction between fixed and random effects is whether or not the unobserved individual effect embodies elements that are correlated with the regressors in the model, not whether these effects are stochastic or not (Greene, 2008).

Furthermore, where you have reason to believe that differences across entities have some influence on your dependent variable, then random effects can include time invariant variables (like gender), whereas, in the fixed effect model these variables are absorbed by the intercepts.

Random effect assumes that the entity's error term is not correlated with the predictors which allows for time-invariant variables to play a role as explanatory variables. Additionally, in random effect there is the need to specify those individual characteristics that may or may not influence the predictor variables. The problem with this is that, some variables may not be available, therefore leading to omitted variable bias in the model. Random effects also allow generalizing the inferences beyond the sample used in the model (Greene, 2008).

Again, in order to use random effects, care must be taken to check whether there is any meaning to using them in a model compared to the fixed effect model. Comparing the two methods, one might think that the use of the random effects estimators as superior compared to the fixed effect estimator, simply because the former is the GLS estimator while the latter represents a limited case of the random effects model as it is in line with cases where the variation in individual effects is relatively large. However, on the other hand, the random effects model is built under the assumption that the fixed effects are uncorrelated with the explanatory variables, an assumption that in reality creates strict limitations in panel data treatment. In conclusion, the difference between these two possible ways of testing models on panel data is that fixed effect model assumes that each firm differs in its intercepts term, while the RE model assumes that each firm differs in its error term. Usually when panel data is balanced, there is tendency that fixed effects will work best. While in cases where sample contains limited observation of the existing cross sectional units, the random effect model might be more suitable.

3.9.3 Hausman Test

To decide between fixed or random effects, the Hausman test is used, where the null hypothesis is that the preferred model is random effects versus the alternative, the fixed effects (Greene, 2008). It basically tests whether the unique errors (u_{it}) are correlated with the regressors. The null hypothesis is they are not.

The procedure for the Hausman test is first, run a fixed effects model and save the estimates, then run the random effects model and save the estimates, then

perform the Hausman test. If the probability of the chi-square values is < 0.05 (i.e. significant), then the fixed effects results is used.

However, some important points to note about Hausman test are as follows:

- It is usually applied to test for fixed versus random effects models.
- It compares directly the random effects estimator βRE, to the fixed effects estimator βFE.
- In the presence of a correlation between the individual variables and dependent variables, the GLS estimates are inconsistent, while the OLS fixed effects results are consistent.
- Where there is no correlation between the fixed effects coefficients and the regressors both estimators are consistent, but the OLS fixed effects estimator is inefficient.
- The null hypothesis is that the preferred model is a random effects model and the alternative is that the fixed effect model is preferred.

STATA version 11 was employed as the software of running and analysing the data. The choice of the version 11 was as a result of its robustness and sophistication. By far, the version 11 was an improvement upon version 10 and simpler to operate or execute. The section that follows attempt to describe the methodology or procedure of operation as much as possible, it shall begin with data management.

Once the data is transferred from Excel and read in, there was considerable work in its cleaning up, then transforming of the variables was undertaken and selecting the final sample. All the data management tasks were recorded, dated and saved. It was thought that the existence of such a record makes it easier to track changes and eases the task of replication. The greatest challenge faced at the stage, as far as this study was concerned, was the issue of transforming the data to econometric form that the software recognizes. Most importantly converting the alpha-numeric data to real numeric and in conformity with econometric form was an uphill task.

The next step was the naming and labelling of variables. The first step was to give more meaningful names to variables by using the rename command. That was done for the variables used in the subsequent analysis. The named or renamed variables retain the descriptions that they were originally given. Some of these descriptions were unnecessarily long, so label variable was used to shorten output from commands. Certainly all the variables were explained earlier in clear terms, and their meanings had already been explained in the earlier part of this chapter, when they were operationalized and measured.

However, after the data management and naming/renaming then viewing data was the next step. The standard commands for viewing data are summarize, list and tabulate. However, relating to panel data commands using STATA version 11 the table below summarizes xt commands for viewing panel data and estimating of linear panel-data models.

Table 3.4
Summary of STATA xt Commands

Summary of xt Commands	
Data Sumary	xtset; xt describe; xtsum, xtdata; xtline, xttab
Pooled OLS	regress
Random effects	xtreg, re; xtregar, re
Fixed effects	xtreg, fe; xtregar, fe
First-difference	regress (with differenced data

The command relevant to our study was the Random effects (RE) and the fixed effects (FE). The command takes the following form, for example where return on asset is used as a dependent variable; along with other explanatory variables of the study:

xtreg roa icp acp app ocatar ocltar dr nls, re
xtreg roa icp acp app ocatar ocltar dr nls, fe

3.10 Model Specification

Model specification is a synchronized arrangement of specific and individual variables embodied in a study in form of equations as they are run to produce an outcome in relation to the dependent variable of the study. Based on the above explanations, the study ran three models with three different measures of profitability namely gross profit margin, net profit margin and return on asset. Therefore, given the foregoing, and following the modeling procedure of Garcia-Terual and Martinez-Solano, (2007), the study employed the following panel regression equations to

effectively cover the explanatory variables embodied in the study. The three models are as follows:

1: GPM = a0 + a1(ICP) + a2(ACP) + a3(APP) + a4(OCATAR) + a5(OCLTAR) + a6(DR) + a7(NLS) + e

2: NPM = b0 + b1(ICP) + b2(ACP) + b3(APP) + b4(OCATAR) + b5(OCLTAR) + b6(DR) + b7(NLS) + e

3: ROA = c0 + c1(ICP) + c2(ACP) + c3(APP) + c4(OCATAR) + c5(OCLTAR) + c6(DR) + c7(NLS) + e

The variables are to be measured as in Table 3.1.

In line with that, the model for the gross profit margin (GPM) was run first. The second model for the net profit margin (NPM) was also run as in the first instance, and finally the third model for return on asset (ROA) was also run. However, after each model was run with both fixed and random effects estimation technique, Hausman tests were also run in order to determine the better result of the two. The data was firstly entered into excel. The descriptive statistics for the data as well as correlation analysis for all the three measures of profitability were also run accordingly.

3.11 Summary of the Chapter

The research methodology was successfully explained in this chapter. It started with the conceptual framework of the study which was followed by the research design, and variables measurement. Thereafter, the population and the sampling of the study

was determined which was followed by methods of data collection, analysis as well as the model specification. The chapter that follows will constitute mainly of the analysis and findings of the study and subsequently the final chapter which shall consist of summary, conclusions and recommendations.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

The main objective of this chapter is to present the findings of the study. In an attempt to establish that, the chapter began with an introduction, which was closely followed by overall description of the data. This description was followed by the descriptive statistics, which was a way of describing in terms of statistics, the distribution of the data especially on the basis of mean, standard deviation, minimum and maximum in line with univariate and bivariate analysis earlier mentioned in Chapter Three. The chapter was then followed by the correlation analysis which was used to measure the association between variables.

However, in line with that, panel regressions based on the three models were run and reported with all the three measures of profitability. This was followed by analysis of Hausman test and the fixed as well as random effects of panel data methodology. Consequently, the results of the respective three measures of profitability were compared and findings were ascertained. This was followed by the summary of the main findings of the study. Based on these findings, the hypotheses were tested, and finally the chapter was concluded with the summary.

4.2 Data Description

The data run, was in respect of 53 manufacturing companies listed on the Nigerian stock exchange. The total supposed number is 55, but the data in respect of two numbers companies namely Grief Nigeria Limited and Lafarge Wapco Nigeria Limited has been incomplete and so disjointed that, the two companies had to be removed, to bring down the number to 53. The number of years covered were five, ranging from 2008 to 2012 for each firm, giving a total number of observations to be 265. The total number of variables studied (observed) for each firm and in each number of years were 10 namely, the gross profit margin, net profit margin, return on assets, average collection period, inventory conversion period, average payment period, other current asset to total asset ratio, other current liabilities to total assets ratio, natural logarithm of sales and debt ratio. Respective ratios were first computed manually in excel, using the appropriate formulae and the respective measures.

However, after computing all the relevant variables and indices in the excel format, the data was later transformed to standard form of econometric for the software to accept. In excel for instance, for all the variables relating to number of days like the average collection period, average payment period, operating cycle and so on, the word “days” accompanied the exact number, like say, “26 days”. That inscription was unacceptable to the STATA because it contained alpha-numeric data, so Alpha “days” had to be removed in all places where it was applicable. The STATA Version 11, then finally accepted the data. The command “xtreg” was the first command to be applied to tell the software that, the data was panel. Then

subsequently all the panel regressions on both fixed and random effects, as well as series of Hausman tests were run accordingly.

4.3 Descriptive Statistics

Descriptive statistics is a term normally given to the analysis of data that helps show, describe or summarize data in a meaningful way such that patterns might emerge from the data. The aim of descriptive statistics is not to allow making conclusions on any hypothesis or interpreting the data to make conclusions. It is just simply a way to describe our data. Below is the descriptive statistics table for the data:

Table 4.1
Descriptive Statistics

Variable	**Obs.**	**Mean**	**Std. Dev.**	**Min.**	**Max.**
ICP	265	38.0541	5.7682	21.0911	92.1305
ACP	265	35.2106	6.8212	20.0321	91.0653
APP	265	44.0762	6.9108	22.0313	96.0221
OCATAR	265	0.1826	0.1304	0.0243	0.3609
OCLTAR	265	0.1691	0.2004	0.0197	0.2986
NLS	265	22.5826	2.2123	17.6752	26.6698
DR	265	0.1950	0.1076	0.0303	0.2104
GPM	265	0.1367	0.0821	0.0973	0.1604
NPM	265	0.0982	0.0692	0.0702	0.1320
ROA	265	0.0769	0.0547	0.0681	0.0892

The above table represents the descriptive statistics of the entire data which constitutes a total number of 10 variables. The total number of observations as mentioned earlier was 265. The descriptive statistics table above shows the mean (average), the standard deviation, the minimum values, the maximum values and the observations for the 10 different variables in the study. From the above table, the

manufacturing firms on the average take 38 days to sell inventory, with standard deviation of 5 days. The minimum number of days taken to convert inventories is 21 days and a maximum of 92 days. The manufacturing firms receive payment from their sales after an average of 35 days with a standard deviation of 6 days. The minimum time taken by the companies to collect cash from customers is 20 days and the maximum is 91 days. Also, on the average, the manufacturing firms wait for 44 days to pay for their purchases, with a standard deviation of 7 days. The minimum time taken to pay creditors is 22 days and maximum is 96 days. Similarly, on average, the other current asset to total asset ratio (OCATAR) was 0.1826, a maximum value of 0.3609 and a minimum value of 0.0243. This means that, on average, other current assets (other than receivables and inventory) constituted about 18% of total assets for these manufacturing firms listed on the Nigerian stock exchange. On the average, the other current liabilities to total asset ratio (OCLTAR) was 0.1691, a minimum value of 0.0197 and a maximum value of 0.2986. This implies that, on average, other current liabilities (other than payables) financed about 17% of total assets of these manufacturing firms listed on Nigerian stock exchange. The size of firm which is measured by the natural logarithm of sales had a mean of 22.5826 and a standard deviation of 2.2133. This variable also had a minimum value of 17.6752 and a maximum of 26.6698. Accordingly, this corresponds to the average size of a manufacturing firm listed on the Nigerian Stock Exchange as having a networth of 150,000,000 million naira (USD 750,000), a minimum value of 20,000,000 million naira (USD 100,000) and maximum value of 1.2 billion naira (USD 6,000,000).

It was also clear that the mean of the debt ratio was 0.1950, with a standard deviation of 0.1076, a minimum value of 0.0303 and a maximum of 0.2107. It therefore implies that, on average, debt financed about 19% of the total assets of the Nigerian manufacturing firms. The gross profit margin (GPM), one of the proxies for profitability and which measures the gross profit increase in relation to sales, has an average of 0.1367 and a standard deviation of 0.0821. It also had a minimum value of 0.0973 and a maximum value of 0.1604. Therefore, the average increase in gross profit relative to sales is 13%. The net profit margin (NPM) was found on the average to be 0.0982 representing 9.8% increase in net profit in relation to sales for all the manufacturing companies on the Nigerian Stock Exchange. The variable had a standard deviation of 0.0692, minimum value of 0.0702 and a maximum value of 0.1320. Finally, the return on asset (ROA) has an average assets return of 0.0769 that is approximately 7.6% and a standard deviation of 0.0547, a minimum of 0.0681 and a maximum value of 0.0892. However, it is clear that in all the proxies for profitability only minimum values were recorded but no loss was experienced by any of the firms within the period of the study. This is so because most of the manufacturing companies get the manufacturing inputs or the raw materials easily as a result of the endowed material resources in the country. More so, companies evade payment of taxes by conniving with tax officials which is part of the antecedents of corruption highlighted earlier in chapter two. Operating at a loss has not been experienced within the period of this study, but low manufacturing value added as shown in the UNIDO report, excess capacity of firms and under utilization of resources among others have been some of the underlying problems as well as the

need to improve upon the existing profitability through working capital management which this study seek to address.

In line with descriptive statistics, the following table is an attempt to explore in terms of distribution of data particularly in relation to the proportion to number of days for companies based on some range. This is particularly for the periods and the relevant cycles.

Table 4.2
Proportion of distribution of number of days

Range for the no. of days	**Proportion of companies in percentage (%)**				
	ICP	ACP	OC	APP	CCC
Less than 3o days	22.36	40.41	30.78	9.5	27.16
Between 31 and 50 days	41.68	20.63	31.89	10.34	25.92
Between 51 and 70 days	18.23	16.80	17.06	12.60	20.07
Between 71 and 90 days	11.40	14.94	10.51	15.36	16.29
More than 90 days	6.33	7.22	9.76	52.20	10.56

Table 4.2 above shows that the three periods of ICP, ACP and APP as well as the two cycles OC and CCC were categorized into five ranges of distribution in terms of number of days, that is based on less than 30 days, between 31 and 50 days, between 51 and 70 days, between 71 and 90 days as well as more than 90 days. The essence of this distribution range is to give an insight as to the proportion in terms of the percentage for each of the categories. Based on above table, it is clear that the ICP, ACP and OC have a higher proportion of companies with less than 30 days and between 31 and 50 days, but fewer companies between 71 and 90 days and more than 90 days. This distribution signifies that the companies enjoy shorter ICP, ACP and OC. However, the APP of most of the companies are longer between 71 and 90 days as well as more than 90 days which signifies a delay in making payment to

creditors. From the distribution, the CCC for most companies lies between less than 30 days, between 31 and 50 days and between 51 and 70 days. This distribution also tilts to signifying a relatively shorter CCC for most companies. The next section that follows presents the correlation analysis which describes the bivariate linear relationship between the variables of the study.

4.4 Correlation Analysis

The essence of correlation analysis is to express the relationship between two variables numerically. Let us recall that, if two variables are strongly correlated, it means an increase or decrease in one variable will be followed by an increase or decrease in the other variable. It is therefore natural that the stronger the correlation, the more possible it is to predict one variable based on the other. On other hand if two variables are uncorrelated, there is no systematic relationship between them, and by implication prediction will not be possible among them. However, it is important to note that correlation is expressed on a scale from 0 to 1. The closer a correlation is to 0, the weaker it is. The closer a correlation is to 1, the stronger it is. Following that line of thought, a correlation of 0 means that the variables are independent of each other, and in the same direction, a correlation of 1 means that the two variables expresses the same thing.

In addition to the above, it is worthy to note that the sign of the correlation coefficient is quite important. The + sign (default) means positive correlation. It signifies that, the two variables are associated, and that they also move in the same

direction, in a systematic way depicting that as one gets larger or higher, so does the other, or as one gets lower or smaller, the other variables also behaves in the same direction. On the other hand, - sign means negative correlation. It signifies that the two variables are associated and systematically they move in opposite direction so that as one gets higher or larger, the other gets lower or smaller, and vice-versa. It is important to note that the sign of correlation is not related to the strength of the correlation.

However, in line with Padachi (2006), that while interpreting the Pearson correlation coefficients care must be exercised because they cannot provide a reliable indicator of association in a manner which controls for additional explanatory variables. That is to say, a mere examination of simple bivariate correlation in a conventional matrix does not in any way take account of correlation of each variable with all other remaining explanatory variables.

For the purpose of this study, the correlation analysis is presented based on all the three measures of profitability as well as all the independent variables and the control variables of the study, as below in Table 4.3.

Table 4.3
Correlation Matrix Table

	acp	**icp**	**app**	**ocatar**	**ocltar**	**nls**	**dr**	**gpm**	**npm**	**roa**
acp	1.0000									
icp	0.4805	1.0000								
app	0.5372	0.5550	1.0000							
ocatar	-0.1327	0.0867	0.0571	1.0000						
ocltar	0.1438	0.0100**	0.0561	0.0191**	1.0000					
nls	-0.1949	-0.1370	-0.0710	0.0640	-0.3425	1.0000				
dr	-0.0279**	0.0300**	0.0072**	0.3073	-0.1421	-0.0035**	1.0000			
gpm	-0.2838	-0.2637	-0.2262	-0.1055	-0.0576	0.2223	0.1411	1.0000		
npm	-0.2709	-0.2904	-0.1994	-0.0760	-0.1337	0.1839	0.0591	0.6235	1.0000	
roa	-0.1367	-0.0258**	0.0361**	-0.1153	-0.1357	0.1978	0.1548	0.3860	0.2450	1.000

** = sig. @ 5%, ***=1%

From the correlation matrix table, the GPM was not found to be associated with any of the independent or control variables. However, as stated by Padachi (2006) that a mere examination of simple bivariate correlation in a conventional matrix does not in anyway take account of correlation of each variable with all the remaining explanatory variables. The emphasis in correlation analysis is just to show the extent of bivariate association among variables ranging from 0 to 1 as well as the direction based on the sign (+ or -).

The NPM was found to have a weak negative relationship with OCATAR and a weak positive relationship with DR. In the case of the former, it suggests that the higher the NPM, the lower the OCATAR indicating an inverse relationship. It suggests that when OCATAR is low then there is the tendency of a high NPM and vice-versa. While in the case of the later, a positive association between NPM and DR indicates a direct relationship signifying that the higher the NPM, the higher the debt ratio. This suggests that an increase in debt ratio leads to an increase in NPM.

The ROA was found to be negative relationship with ICP and positive relationship with APP. The negative relationship of ROA with ICP denotes an inverse relationship. It further suggests that the lower the ICP the higher the ROA. It indicates that a shorter ICP results to a higher ROA. On the other side, the positive relationship between ROA and APP indicates a direct relationship, it suggests that the longer the APP, the higher the ROA.

However, turning to correlation among independent and control variables, a weak relationship exists between OCATAR and ICP as well as OCATAR and

APP. In the first instance, there is a positive relationship between OCATAR and ICP with coefficients value of 0.0867, same explanation goes for OCATAR and APP with coefficient weight of 0.0571. The OCLTAR is positively related with both ICP APP and OCATAR with coefficient values of 0.0100, 0.0561 and 0.0191 respectively. The NLS which represents the company size was found to be negatively correlated with APP at -0.0710 and positively with OCATAR at 0.0640. The DR a control variable for this study was found to be negatively correlated with ACP and NLS at -0.0279 and -0.0035 respectively. The DR was also found to be positively associated with ICP and APP at 0.0300 and 0.0072 respectively. However, it is worthy to note that in both cases discussed above, there was no case of any observed multicollinearity among variables. From the table also, the bivariate association among the variable have always been within the acceptable level and there was no multicollinearity observed among the variables.

4.5 Panel Regressions Analyses

The three panel regression models, each on each of the three dependent variables measuring profitability, i.e GPM, NPM, ROA were run. However, prior to that, three tests were conducted for each model, they are, the variance inflation factor test for multicollinearity, the Wooldridge test for autocorrelation in the panel data and the serial correlation test for heterosekesdacity. The essence of these series of tests is to ensure models are free from multicollinearity, autocorrelation and heterosekesdacity. Conducting these tests ensures better and more accurate findings.

4.5.1 Gross Profit Margin (GPM) Model

The first test conducted for GPM model was the variance inflation factor (VIF) test, to check for multicollinearity. The results are as follows:

Table 4.4
Result of Variance Inflation Factor test for GPM model

Variance	VIF	I/VIF
ACP	1.78	0.5628
APP	1.72	0.5796
ICP	1.67	0.5980
OCATAR	1.31	0.7649
OCLTAR	1.18	0.8456
NLS	1.26	0.7924
DR	1.25	0.8016
Mean VIF	1.45	

The above test was conducted under pooled OLS, the outcome of the test confirmed that there was no multicollinearity in the model. The mean VIF was found to be 1.45. Generally, under normal circumstance, VIF mean should not be more than 5. Therefore, the model was confirmed free of multicollinearity.

The second test conducted for this model was the Wooldridge test for autocorrelation. The result of the test for GPM model is that the probability of F-statistic being more than the critical value is 18.29% (The prob > F = 0.1829) which is not significant, and thus, the assumption of no autocorrelation cannot be rejected. Therefore, based on the above result, the model could be said to be free from autocorrelation.

The third test conducted for the GPM model was the serial correlation test for heteroskedascity, with the command (xt test). The Chi-square probability was found as 0.0000 (This signifies the presence of heteroskedascity in the model). Therefore according to Asterious and Hill (2007), to treat heterosekesdacity problem, a model should be made robust and hence the robust model should be reported. Accordingly, the GPM model was made robust and reported. Making a model robust is simply logging all the variables in the model (this can be seen in appendix B). After conducting the relevant tests, the following is the GPM random effect results:

Table 4.5
Summary Table of Model 1 (GPM, random effect result).

GPM	Coefficients	Z value	P value	Decision
ACP	-04104	-6.22	0.000***	-sig.
ICP	-0.3381	-4.61	0.000***	-sig.
APP	0.4051	4.45	0.000***	+sig.
OCATAR	-0.0841	-2.58	0.010**	-sig.
OCLTAR	0.0270	0.87	0.386	not sig.
NLS	0.8215	2.78	0.006***	+ sig.
DR	0.0027	0.20	0.839	not sig.

*** (1% sig. level) ** (5% sig. level)

Accordingly both fixed effects and random effects were run, and that the influences of the independent variables on the GPM were similar for the two models. In addition, Hausman test was used to select the more superior of the two models, which in this case is the random effects model. Based on that, the overall model has a quite good fit, with F statistics as 0.000, and the overall R-square value of 0.5234. The result also disclosed that the average collection period (ACP) was significantly and negatively related with gross profit margin at less than 1% (0.0000) level of

significance. The interpretation of this finding is that, the lower the average collection period (ACP) the higher the gross profit margin (a proxy for profitability). This depicts an inverse relationship. It goes further to suggest that manufacturing companies on the Nigerian stock exchange should always strive to ensure minimum number of days within which they collect their receivables from the respective debtors. This leads to higher profit. However, where the average collection period extends longer, the gross profit margin will be lower, and thus affect the companies' profitability. This finding is consistent with most studies conducted, notably Deloof (2003), Raheman and Nasr (2007), Padachi (2006) and Mathuva (2010).

Another important variable in the model is the inventory conversion period (ICP). Finding from the panel data regressions of the GPM model signifies that the ICP was strongly and negatively related to gross profit margin (GPM). This result suggests that, the shorter the inventory conversion period in terms of number of days, the higher the gross profit margin (a proxy for profitability). The finding is also consistent with studies of Deloof (2003), Garcia-Terual and Maurtinez-Solano (2007) and Afza and Nazir (2007).

Additionally, in line with the resource-based theory, inventories are important resources to manufacturing companies and thus maintaining them is very vital for the survival of the companies. Let us also recall that according to Van Home and Wachwiczs (2004) more than 50% of the current assets of a typical manufacturing company are inventories. The negative significant relationship between ICP and profitability indicates that based on the GPM model, a shorter inventory conversion period leads to higher profit. A shorter ICP means the

inventory resources are converted in a shorter period and this facilitates the inventory usage. The resource-based theory is employed in this model to explain the relevant of size of companies as one of the control variable of this study. Size of companies was measured by the natural logarithm of sales, and size itself is a product of resources and plays a vital role in firms' profitability.

The average payment period (APP) based on the result of the GPM model, was found to be strongly and positively related to gross profit margin. That is, at less than 1% (0.0000) significance level. This finding connotes that the longer it takes the companies to pay back their creditors, the higher the gross profit margin. In line with this finding therefore, Nigerian manufacturing companies on the stock exchange could improve their profit if they delay or prolong payment to their suppliers or creditors. This is in conformity with the principle of the financial management, which advocates hastening of receivables and delaying making payments. By so doing, a company might have held the cash for a reasonable time period which could be turned over to make additional gains. This finding is consistent with most of the studies conducted on working capital management and profitability, some of them include; Deloof (2003), Afza and Nazir (2007), Ghosh and Maji (2010), Ali (2011) and Ukaegbu, et al (2014).

From the results and findings of the above three components of cash conversion cycle, namely; ACP, ICP and APP, it was clear that the three components have all been found to be statistically significant. This by extension connotes by implication that the cash conversion cycle is significant with profitability. It goes further to suggest that in the context reducing CCC can increase profit. This finding

is in consistent with the studies of Deloof (2005), Lazaridis and Tryfonidis (2006), Afza and Nazir (2007), Hussein, et al (2010) and Alipour (2011).

Based on the findings so far, in respect of the average collection period of (ACP) and inventory conversion period (ICP) it was clear that the duo were found to be statistically significant in relation to gross profit margin (GPM). Let's also recall that the operating cycle is the composition of the ACP and ICP, it therefore follows that the operating cycle as far as GPM model is concerned, has also been found to be statistically significant with the profitability.

Another variable considered in the study was the other current assets to total assets ratio (OCATAR). The variable was found to be negatively related and significant at less than 5% level in the GPM model with coefficient value of -0.0841 and the P value of 0.010. The interpretation of this result is that, the lower the other current assets to total assets ratio (other current assets minus receivables and inventory), the higher the gross profit margin. Let us recall that, other current assets to total asset ratio measures the composition of other current assets compared to the total asset of a company. The simple interpretation of this negative significance is that, the higher the OCATAR the lower the profitability, conversely the lower the OCATAR, the higher the profitability. This suggests that higher investment in other current assets (flexible working capital investment policy) translates to lower profitability of the manufacturing companies listed on the Nigerian stock exchange. The implication of this is that more restricted working capital investment policy is more profitable than a more flexible policy by the Nigerian manufacturing firms listed on the stock exchange. The finding goes further to validate the earlier assertion

in chapter two (Literature review) that majority of the empirical studies support the convention of maintaining lesser investment (at least at an appropriate proportion) in working capital would positively affect the profitability of firms (restricted working capital investment policy). This does not mean maintaining a zero current asset, since it is never possible. The finding is consistent with the study of Raheman, et al (2010).

It is also to be understood that borrowing from the risk and return theory, the decision to adopt a restrictive or flexible working capital investment policy involves a trade-off in most instances. It is also goes further to explain that maintaining lesser of current asset in relation to total assets composition which according to this study`s finding increases profitability, may be at the expense of liquidity. Hence, there must always be a trade-off between the important goals of liquidity and profitability.

Based on the result from the GPM model, the other current liabilities to current asset ratio (OCLTAR) which is other current liabilities minus payables was found not to have a significant relationship with gross profit margin. The variable measures the composition of other current liabilities in relation to total assets of a company. The study of Nor Edi and Noriza (2010) as well as Afza and Nazir (2007) found a negative significant relationship between CLTAR and profitability. By implication, a lower OCLTAR is preferred. Companies are expected to maintain lower current liabilities to total asset ratio.

The next variable in the GPM model is the natural logarithm of sales (NLS) which was used as a control variable and also as a proxy for company size.

The NLS was found to be positively significant with gross profit margin. The finding suggests that when the companies extend in size, their gross profit margin increases. This finding is consistent with the study of Nor Edi and Noriza (2010) and Raheman and Nasr (2007). Companies' growth without corresponding increase in profitability should be avoided in the manufacturing companies listed on the Nigerian stock exchange.

The next control variable considered in the GPM model was the debt ratio (DR). This control variable was found not to have a significant relationship with gross profit margin. The coefficient was found to be 0.0027 and a p value of 0.839. However, where the debt ratio is found to be negatively significant with GPM, it denotes that as the debt ratio reduces, implying a reduction in the composition of total debtors relative to the total assets of the manufacturing companies, which could mean increase in the cash sales, then the gross profit margin increases. This scenario is consistent with the finding of Imran and Noursheen (2010). In line with risk and return theory, investment decisions with higher risk also have a higher return, and vice-versa. Therefore, decisions to have high concentration of debtors financing seems to be riskier and that justifies the scenario of a positive relationship between debt ratio and gross profit margin (GPM). Having considered the GPM model, the next model run was the net profit margin model.

4.5.2 Net Profit Margin (NPM) Model

For the net profit margin (NPM) model, the first test conducted was the variance inflation factor (VIF) test. The purpose of this test was to check for multicollinearity among the variables in the model. The results for the test are as follows:

Table 4.6
Results of Variance Inflation Factor test for NPM Model.

Variable	VIF	I/VIF
ACP	1.78	0.5629
APP	1.71	0.5861
ICP	1.67	0.5978
OCATAR	1.20	0.8355
OCLTAR	1.23	0.8134
NLS	1.22	0.8189
DR	1.20	0.8349
Mean VIF	1.43	

From the above result, the VIF mean was found to be 1.43 which is less than 5. This indicates that, there is no multicollinearity in the model. The next test conducted then was the Wooldridge test for autocorrelation in the panel data, the result indicated that there was no first order correlation and prob > f was equal to 0.2038 (not significant). Based on this, the result indicates no auto correlation. There would have been the presence of autocorrelation had the value of prob. >f found to be significant.

The next test conducted was the serial correlation test for heterosekesdacity which was performed using the (xt-test 3) command for re. The

prob. > chi 2 = 0.0000, based on the chi 2 value which was significant, this implies that there exists heterosekesdacity problem. However, according to Asterious and Hall (2007), when heterosekesdacity problem is observed, all the variables are logged, and the model be made robust by using the (VCE robust) command. Henceforth, by doing that, the problem of heterosekesdacity is treated. The fixed effects and random effects were both run, and the influences of the independent variables on the NPM were similar. Based on that Hausman test was used to select the more superior of the two models and the random effects was chosen and the robust model is reported accordingly.

Table 4.7
Summary Table of model 2 (NPM, random effect result)

NPM	Coefficient	Z value	P value	Decision
ACP	-0.6466	-6.12	0.000***	-sig
ICP	-0.7807	-6.70	0.000***	-sig
APP	0.6204	4.29	0.000***	+sig
OCATAR	-0.2286	-1.91	0.056	-sig
OCLTAR	0.0261	0.54	0.591	not sig
NLS	0.6605	1.78	0.074	+sig
DR	0.0030	-0.15	0.883	not sig

*** (1% sig. level) ** (5% sig. level)

The results of the regression from the NPM model signified an overall good model fit with F statistic of 0.0000. That testify how good the overall model is. The R-square was found as 0.4632 which explains the level to which the independent variables associate with the dependent variable.

From the above, the results indicate that the average collection period (ACP) and inventory conversion period (ICP) were negatively and significantly related to the net profit margin (NPM) with coefficient values of -0.6466 and -0.7807 respectively. The negative relationship connotes that, as either of these variables is low, then the NPM increases. The result also signifies that the average payment period (APP) was positively and significantly related to the net profit margin (NPM) with coefficient values of 0.6204. The result depicts that when the variable is low, then the NPM will also be low, and vice-versa. Consequently the result of the remaining two variables in the model, that is the OCLTAR and DR were not significant with net profit margin (NPM). Also a weak significance for OCATAR and NLS has not also been considered as significant. According to Chin (1998), significance at 10% significant level is accepted, although as a weak significance.

Basically, the result obtained for the GPM and NPM model were a bit similar in terms of the statistical significance, either positivity or negativity in the relationships with the only difference in the weak significance experienced in NPM model with respect OCATAR and NLS. Therefore, all the discussions on GPM model also hold for the NPM model. The next model to be considered is the third and final model of return on assets (ROA).

4.5.3 Return on Assets (ROA) model

With respect to the ROA model, the first test this study conducted was the variance inflation factor test (VIF) for checking multicollinearity among the variables in the model. The following represents the results of the VIF test.

Table 4.8
Result of Variance Inflation factor test for ROA Model

Variable	VIF	I/VIF
ACP	1.65	0.6075
ICP	1.60	0.6247
APP	1.70	0.5881
OCATAR	1.17	0.8582
OCLTAR	1.22	0.8186
NLS	1.20	0.8351
DR	1.19	0.8401
Mean VIF	1.39	

Based on the outcome of the VIF test, the mean VIF was found to be 1.39. This figure is far less than 5, and therefore it suggests that there was no multicollinearity among the variables in the model.

The next test conducted was the Wooldridge test for autocorrelation. The test was conducted using the command of the STATA. The result of the test revealed that, there was no autocorrelation in the model with Prob > f = 0.1713 (not significant).

Finally, the serial correlation test for heterosekesdacity was performed. The result was found as the Probability > Chi square = 0.0000. Based on this result which appears as significant, the presence of heterokedascity was detected in the

model. Therefore, to treat it, the model was logged and made robust as suggested by Astorous and Hill (2007) using the appropriate command of VCE robust, and based on that the result of the robust model is reported. According to the Hausman test, the random effect was chosen ahead of the fixed effect after running the two effects and is reported below:

Table 4.9
Summary Table of Model 3 (ROA, random effect result).

ROA	Coefficient	Z value	P value	Decision
acp	-0.5967	-7.49	0.000***	- sig
icp	-0.6326	-6.83	0.000***	- sig
app	0.7493	6.66	0.000***	+ sig
ocatar	-0.1417	-1.33	0.184	not sig
ocltar	0.0702	1.73	0.085	+ sig
nls	0.0365	1.04	0.300	not sig
dr	0.2340	-2.39	0.018**	- sig

*** (1% sig. level), ** (5% sig. level)

The ROA random effect model signified an overall model fit for the F statistics of 0.0000 and adjusted R- square value of 0.5279. From the above regression result of the random effect, the average collection period (ACP) and the inventory conversion period (ICP) were found to be negatively significant with the return on asset (ROA) as dependent variable and a proxy for profitability. This finding is synonymous with that of the two models of GPM and NPM presented earlier and same explanation also goes for this finding as well. The average payment period (APP) was also found to be positively significant with ROA as was in the

case of the other previous models discussed earlier (GPM and NPM). This explanation is the same with earlier one given with respect to the other two previous models. Since the finding was the same.

However, the OCATAR in this model was found as not significant with coefficient value as -0.1417, this finding is contrary to that of GPM and NPM models where variable was found with weak negative significance. The variable OCATAR (other current assets to total assets ratio) was not significantly related to return on assets (ROA), this may not be unconnected with the fact the proxy for profitability (ROA) measures asset efficiency in yielding companies` profitability.

Similarly, the OCLTAR (other current liabilities to total asset ratio) was found to be positively significant with ROA, although a weak significant level. However, for the sake of interpretation here, the weak significance is not considered as significant. This finding is also contrary to those of GPM and NPM. In the previous model the variable (OCLTAR) was found as not significant. The positive significant relationship between OCLTAR and ROA connotes that when OCLTAR increases, also ROA increases. Although this finding may seem unacceptable to reasoning, the possible explanation could be that, as a result of having more liabilities and accruals, companies might have utilized such as sources of financing, re-invested and generated more profit. The study of Nor Edi and Noriza (2010) found a negative significant relationship between CLTAR and profitability depicting that as the ratio of current liabilities to total assets reduces, the profitability increases. This finding seems to appeal more to reasoning, but then research is always about new discoveries, new ideas and perhaps new contribution.

The natural logarithm of sales (NLS) employed in this study as a control variable, was found in ROA model to be not significant. This finding is contrary to the earlier findings when the GPM and NPM models were run. In the last two models, same variable NLS was found to be positively significant. This finding therefore suggests that company size (which the NLS represents) is not significantly related to return on assets. This also connotes that the size of either of the manufacturing companies listed on the Nigerian stock exchange is inconsequential as far as their return on asset is concerned. This is in line with Nobanee and Al-hajjar (2012).

The last variable in the model, which was also a control variable that is debt ratio, was found to be negatively and significantly related with return on asset, at less than 5% significant level. This finding is also contrary to those in GPM and NPM as proxies of profitability. In GPM and NPM models, debt ratio was found as not significant. Hence, our present finding of a negatively significant relationship suggests that as the respective debt ratios of manufacturing companies on Nigerian stock exchanges decreases, their return on assets increases. This finding is consistent with Nor Edi and Noriza (2010), Afza and Nazir (2007) as well as Imran and Noursheen (2010). The finding depicts that a lower debt ratio enhances return on assets as a proxy for profitability.

4.6 Comparison of Results of the Three Measures of Profitability

The following table 4.20 shows a comparison of the results for the three measures of profitability using the three respective models of GPM, NPM and ROA.

Table 4.10
Comparison of Results for the Three Measures of Profitability

	Model 1(GPM)	**Model 2(NPM)**	**Model 3(ROA)**
ACP	-04104***	-0.6466***	-0.5967***
ICP	-0.3381***	-0.7807***	-0.6326***
APP	0.4051***	0.6204***	0.7493***
OCATAR	-0.0841**	-0.2286	-0.1417
OCLTAR	0.0270	0.0261	0.0702
NLS	0.8215***	0.6605	0.0365
DR	0.0027	0.0030	0.2340**
Model type	Random effects	Random effects	Random effects
Multicol. (MeanVIF	1.45	1.43	1.39
Autocorr.	0.1829	0.2038	0.1713
Hetero-Kedascity	Heterokedastic but remedied using robust procedure	Heterokedastic But remedied using robust procedure	Heterokedastic But remedied using robust procedure
Model Fit (F-statis.)	0.0000	0.0000	0.0000
Adjusted R-square	0.5234	0.4632	0.5279

The above table presented a summary of the panel data regression results at a glance. The explanations with respect to each model and in relation to all the variables of the study have already been presented when the individual models were run independently. The essence of the above comparison table is to give an overall picture of the results at a glance, to point out the areas of similarity and differences among the models and to further show the consistency or otherwise of

the set of IVs on the different DVs and draw a conclusion preparatory to discussion on the findings of the study.

Based on the above table, the results of the GPM and NPM models were basically the same in terms of statistical significance with respect to all the set of IVs, with only difference in the values of the coefficients and magnitudes of the respective P values. In line with the two models of GPM and NPM, the ACP and ICP were both negatively significant. The inverse relationship indicates that the shorter the period for the collection of receivables and also the period for the conversion of inventories into sales, the higher the profit, both gross and net over sales. It follows that when these periods are shorter, the turnover rate is faster and this consequently increases profitability. Also, from the two models of GPM and NPM, the average payment period was found to be positively significant. The reason for this positive association may not be far-fetched. It suggests that when companies delay payment to their suppliers or creditors, the amounts could be used to generate income and profit, when it is used internally rather than paid out immediately. This increases profit. Also, in both models (GPM and NPM), OCATAR was found negatively related but weakly significant in NPM. The result was interpreted to mean, that restricted working capital investment policy enhances profitability of the Nigerian manufacturing companies. In both models, the NLS was found to be positively significant suggesting that increase in company size is associated with higher profitability. Conclusively, the two models found that the OCLTAR and the debt ratio (DR) were not significant. It is therefore clear that while findings with respect to ICP, ACP and APP are consistent in all the models, there is significant

difference in other variables. For example, OCATAR and NLS have been significant in GPM model but not significant in NPM (since the significant level is too weak) and can not be considered as such.

Now, the third model of ROA also had consistent result with GPM and NPM in ACP, ICP and APP, but had a contrasting result for OCATAR, OCLTAR, NLS and DR. The ROA model results show that OCATAR, OCLTAR and NLS were not significantly related to ROA. This is contrary to the case of GPM model where OCATAR and NLS were both significant. Another important difference is that DR was found to be significant in ROA but not significant in both GPM and NPM. The OCLTAR remains as not significant across the three measures of profitability. All discussions relating to the implication for the findings were provided when the ROA model was run. However, an attempt is only made here to highlight the areas of difference in the respective results.

In line with above discussion, it can be seen that the set of IVs had different influence on the respective DVs. For example, it can be said that the set of IVs influence on GPM and NPM has been in the same direction to some extent, but certainly the coefficient weights and respective P values were not the same. The values of the coefficients in GPM model was more than in the NPM. However, the situation is more glaring when a comparison is made between the GPM/NPM and ROA. The GPM and NPM are more consistent. The set of IVs are more consistent on explaining the GPM and NPM than ROA. The reason why the set of IVs are more consistent in explaining the GPM and NPM could be traced to the fact that the gross profit margin and the net profit margin measures the marginal or additional increase

in profit in relation to sales. The mode of their measurement in terms of formulae is almost the same. More so, the set of IVs for example ICP, ACP and APP are more as sales inclined than as assets inclined in the direction of profitability. Perhaps that explained why GPM and NPM have more robust finding than the ROA. Drawing from the above analysis, the GPM and NPM models are more consistent, although there are some diffirencies between the two, but are explained better by the IVs. All the outputs for the regressions with respect to fixed and random effects, Hausman tests and all the series of tests conducted are provided as appendix B.

4.7 Summary of Findings of the study

The findings of this study are presented in the subsequent paragraphs and they are in line with the research questions, research objectives as well as the hypotheses developed earlier in the study. The various independent variables of the study are presented in line with the main findings.

Finding from the study revealed that the average collection period (ACP) which is the average time it takes manufacturing companies on the Nigerian stock exchange to collect receivable from their debtors was negatively related to profitability. This finding point to the fact that, the shorter the number of days it takes to collect their receivables from debtors, the higher the profitability and vice-versa. This finding seems to be the popular finding among most studies on working capital management and profitability hence it is consistent with the studies of Deloof

(2003), Padachi (2006), Raheman and Nazr (2007), Mathuva (2010), and Ukaegbu, et al (2014). The rationale behind this finding is that logically when firms make collections from their receivables as fast and as short as possible, then it means the firms did not tie down their resources as receivables, and so when the receivables are collected sooner, the money could be used to fund their operations over again to increase profitability and create wealth. Also, relating to this finding, if a company decides to ensure a shorter collection period, it should be doing that at the expense of possible repercussion of losing customers, but may be rewarded with an increase in profitability. According to risk and return theory, decisions with high risk, has a higher return and vice-versa. For example, where a firm decides to shorten its collection period in order to enjoy a higher profit as found in this study, then it may do that sometimes at the risk of losing customers since they (the customers) can not enjoy a longer re-payment period. Other possible risks and incidental costs are that a firm may likely have to motivate customers to make prompt and early payments by providing discounts, bonuses and other forms of incentives. Therefore for a firm to enjoy a higher return (profit) through a shorter collection period, it may have to face some associated risks as mentioned above.

One significant finding of this study is that the inventory conversion period (ICP) was found to be negatively and significantly related with profitability. This inverse relationship depicts that, the shorter the inventory conversion period, the higher the profitability. In essence, based on this finding, companies can increase their profitability if they shorten their inventory conversion period. The reason here could be viewed from the fact that the rate at which inventories are converted into

finished goods especially in the manufacturing companies, shows the turnover rate, efficiency rate and also the volume of sales, Henceforth, the shorter this conversion takes place, the more the volume of sales, and indeed the more increase in profitability of companies. This finding is consistent with numerous studies such as Deloof (2003), Padachi (2006), Mathuva (2010) and Alipour (2011). Inventories are important assets especially to a manufacturing firm. According to resource-based theory, the resource of a firm is related to its size. Basically, based on this finding, a negative significant relationship between ICP and profitability supposes that when the period for the conversion of inventory is shortened, the profitability of firms will be higher. Shortening ICP involves efficient and fast production process, effective managerial skills, good monitoring and proper interlink of the various processes. Resources are the catalyst in achieving all these, and the size of a firm is fundamental in this regard. All these efforts are resource-based and therefore their effective combination in ensuring a shorter period (ICP) increases the profitability of firms. This explains why "SIZE" is used as a control variable for this study.

Based on the finding of this study, the average payment period (APP) was found to be significant and positively related to profitability. Based on this finding, a longer average payment period lead to higher profit, This is interpreted to mean, that the longer the Nigerian manufacturing companies takes to pay their suppliers (creditors) the greater the profitability. A longer APP involves delaying payment to creditors of a firm or designing a policy of a prolonged repayment period. Logically, it implies that if the companies should delay payment to creditors, it means that money could be re-invested to create additional wealth. Its retention

means additional capital for re-investment and prospective gains. This is in conformity with the old doctrine of financial management which advocates hastening of receivables and delaying payments. This finding is in line with studies of Afza and Nazir (2007), Mathuva (2010) and Ali (2011). Following from the theory of risk and return, investment decisions with high risk has higher return and vice-versa. Some of the risks and repercussions of a longer APP includes accepting the risk of losing some incentives normally accorded to early payments, losing creditors' confidence (if the action is deliberately done) and maintaining liabilities for a longer period. It therefore follows that the opportunity costs of all these is the increased profit of a firm, that is a higher return.

From the above findings and based on the three components of the cash conversion cycle (ACP, ICP and APP), the cash conversion cycle is significantly related to profitability by implication. This finding has therefore been in line with the research questions, research objectives and the hypothesis of the study and also in line with studies of Deloof (2003), Garcia-Terual and Maurtinez-Solano (2007), Afza and Nazir (2007) and Dong and Su (2010). Similarly, since the ACP and ICP have been found to be statistically significant with profitability, it then implies that the operating cycle has also been successfully found to have a significant relationship with profitability. This finding is consistent with the study of Raheman, et al (2010).

Another significant finding of this study is that, the other current asset to total asset ratio (OCATAR) was found to be significant and negatively related to profitability in GPM model and weakly, negatively related in NPM model with

profitability. This finding is interpreted to mean that, the lower the OCATAR, the greater the profitability. Much has so far been said about this when the result of the variable was interpreted. Following the risk and return theory, the financial manager should be guided by the fact that investment with high risk has a higher return and vice-versa. For example if the companies adopt the restricted working capital investment policy, in favour of profitability, they need to assume the risk of lower liquidity. So there is a trade-off.

The other current liabilities to total asset ratio (OCLTAR) was found to be not significantly related to profitability. The study of Nor Edi and Noriza (2010) as well as Afza and Nazir (2007) found a negative significant relationship between CLTAR and profitability.

The natural logarithm of sales (a proxy for company size) was also found to be positively significant with profitability. It was used in this study as a control variable. This finding suggests that when companies expand in size, their profitability also expands. This finding is consistent with the study of Nor Edi and Noriza (2010). Logically, growth and expansion of companies are associated with so many things like bigger capital, more sales, more assets and possibly more resources. These could translate to high profitability. In line with resource-based theory, the combination of these resources is catalyst for expansion and growth as well as enhanced profitability. Moreso, resource-based theory is a basis for "SIZE" which has been included in this study as a control variable.

Similarly, the debt ratio (DR) was also employed in this study as a control variable. The DR was also found as not significant in relation to profitability

in both GPM and NPM models, but found to be significant and positively related in ROA model. However, the study of Imran and Noursheen (2010) found a negative significant relationship between DR and profitability.

4.8 Hypothesis Testing

In chapter three, some hypotheses were developed in order to establish the relationships between the different independent variables of this study and profitability. However, let us individually examine those hypotheses in relation to the findings of the study.

$H_{1:}$ There is a significant relationship between ICP and profitability.

Findings from the study based on the results obtained signified a negative significant relationship between the inventory conversion period and profitability. Therefore, hypothesis number one (H_1) was supported.

H_2: There is a significant relationship between ACP and profitability.

Findings from the study indicated a negative significant relationship between the ACP and profitability. Based on that, H_2 was supported.

H_3: There is a significant relationship between OC and profitability.

Based on the findings of the study, there is an implied negative significant relationship between the OC and profitability. The significance in this relationship was actually established because the constituents of OC that are ICP and ACP were significant. Therefore, the H_3 was also supported.

H_4: There is a significant relationship between APP and profitability.

The findings of the study as presented revealed a positive significant relationship between the APP and profitability. Therefore, the H_4 was supported.

H_5: There is a significant relationship between cash conversion cycle (CCC) and profitability.

Findings from the study indicated an implied significant relationship between CCC and profitability, since all its components (ICP, ACP and APP) were all found to be statistically significantly related to profitability. The H_5 is therefore supported.

H_6: There is a significant relationship between OCATAR and profitability

The findings of the study as presented earlier, revealed a significantly negative relationship between the OCATAR and profitability for GPM and a weak significance for NPM model, while not significant for ROA model, therefore there was no consistent evidence to conclude that OCATAR influenced all the three measures of profitability. Hence H_6 was not supported.

H_7: There is a significant relationship between OCLTAR and profitability.

Findings from our study revealed a non- significant relationship between the current liability to total asset ratio (OCLTAR) and profitability in both GPM and NPM models while weak positive significance in ROA model as reported earlier, therefore H_6 was not supported.

The above discussion could be summarized in a tabular form as presented below:

Table 4.11
Hypotheses Testing

Hypothesis	Statement	Decision
H_1	There is a significant relationship between the ICP and profitability.	Supported
H_2	There is a significant relationship between ACP and profitability.	Supported
H_3	There is a significant relationship between the OC and profitability.	Supported
H_4	There is a significant relationship between the APP and profitability.	Supported
H_5	There is a significant relationship between CCC and profitability.	Supported
H_6	There is a significant relationship between OCATAR and profitability.	Not Supported
H_7	There is a significant relationship between OCLTAR and profitability.	Not Supported

Therefore, the next section attempts to summarize the entire chapter.

4.9 Summary of the Chapter

The chapter started with an introduction, which was a preamble to what was expected of the chapter and its main mission. This was followed by the description of the data. The descriptive statistics of the entire data was presented as well, with the averages, minimum values, maximum values as well as standard deviations. This part was closely followed by the correlation analysis for the study.

The main panel regressions were run afterwards based on all the three models. In each model both fixed and random effects were run as well as the Hausman tests. Based on the results of the Hausman test, a more preferred estimation method, i.e the random effects, was then reported. The findings after each model

were presented, discussed and interpreted. The stage that followed was a comparison of the results of the three different measures of profitability and drawing a conclusion for the study. This was followed by the most important caption of this chapter which was the presentation of the main findings of the study. The findings were then closely followed by testing of hypothesis in order to ascertain those that the findings support and those that the findings did not support. That ends the discussion on the chapter, and the next chapter is chapter five.

CHAPTER FIVE

SUMMARY AND CONCLUSION

5.1 Introduction

The previous chapter discussed the data analysis, results and findings used in answering the research questions and objectives. Therefore, this chapter is focused to the concluding aspect of the study. It starts with recapitulation of the key findings of the study. The section that follows discusses the contributions of the study. The limitations of the study are then highlighted. This is followed by recommendation for future research and finally the conclusion. Basically, the essence of this chapter is to provide the concluding elements of the study. It is aimed at providing an ideal atmosphere for drawing the curtains of the study conclusively.

5.2 Recapitulation of the Key Study Findings

The cash conversion cycle (CCC) through its respective components was found to be significantly related with profitability by implication. This is in line with most studies on working capital management and profitability, such as Deloof (2003), Afza and Nazir (2007), and Mathuva (2010).

Another important finding is that, the operating cycle could also be said to be significantly related with profitability by implication. This was consistent with Raheman, et al (2010). The study found that the inventory conversion period (ICP)

was negatively related with profitability. This could be interpreted to mean the shorter the period of inventory conversion, the greater the profitability and conversely the longer the inventory conversion period, the lower the profitability of manufacturing companies listed on the Nigerian Stock Exchange. The finding was also consistent with the studies of Deloof (2003), Padachi (2006) and Alipour (2011).

The study also found the average collection period (ACP) to be negatively related to profitability. This finding suggests that, the shorter the average collection period, the higher the profitability and conversely the longer the collection period, the lower the profit of the manufacturing companies listed on the Nigerian Stock Exchange.

However, the average payment period (APP) was found to be positively related with profitability. The positive relationship with profitability connotes that, the longer the average payment period (APP), the higher the profitability and on the other hand, the shorter the APP the lower the profitability of manufacturing companies listed on the Nigerian Stock Exchange. These findings are in conformity with the financial management doctrine of hastening of collections or receivables and delaying of payments to creditors. It was also consistent with the studies of Padachi (2006), Danulatiu (2010) and Nor Edi and Noriza (2010). Furthermore, the study did not find other current assets (without inventory and receivables) over total assets ratio (OCATAR), other current liabilities (without payables) over total assets ratio (OCLTAR), debt ratio (DR) and sales (SIZE) to consistently influence all the

three measures of profitability used in this study i.e. gross profit margin (GPM), net profit margin (NPM) and return on assets (ROA).

5.3 Contributions of the Study

This study has made significant contributions to the knowledge of working capital management and profitability especially in the manufacturing sector. This section discusses the academic contributions of the study. Academic contributions are viewed from perspective of the variables of the study. It shows the contribution of the study in the area of its framework, and the linkage of the dependent, independent (explanatory) as well as control variables employed in the study. More so, its scope also constitutes the use of concepts and theories in either determining the variables to be included in the model or to explain the influence of the independent variables on the dependent variable. Therefore, taken together, the academic contributions of this study could be seen in the following areas:

One of the important academic contributions of this study is its ability to draw a line of demarcation between the CCC and OC. Although all the components of OC are still found in CCC, the study assessed their implied significance. The study also contributes academically from the dependent variable`s perspective. The dependent variable of this study (Profitability) was measured with the three measures, namely the gross profit margin, the net profit margin and the return on assets. Although some studies equally measured profitability with different measures in a single study, for example Ching, et al (2011), that measured profitability through return on investment, return on asset and return on sales, no study to the best

knowledge of the researcher had co-opted the three proxies of the gross profit margin, the net profit margin as well as return on asset distinctly to measure profitability. In line with that the impact of working capital management on profitability is not consistent for the different profitability measures. Although the findings have been consistent for the three different measures of profitability with respect to some variables (ICP, ACP and APP), it was not consistent with other variables, namely, OCATAR, OCLTAR, NLS and DR. Taken individually, OCATAR found significanct in GPM model while it was not significant with ROA and NPM models. OCLTAR was not significant in GPM, NPM, and ROA models. Also, NLS had a positive significance with GPM, and was not significant in ROA and NPM models. The debt ratio was not significant in both GPM and NPM models, but had a statistical significance with ROA. However, the most important variables of this study which are the components of both CCC and OC that is ICP, ACP and APP have been consistent in all the three different measures of profitability. This could also be seen as an important academic contribution of this study.

Another important academic contribution of this study is in the area of using some concepts and theories to select the variables to be included in the model and in explaining the findings. This study employed the concepts of operating cycle, cash conversion cycle, working capital investment and financing policies and theories of liquidity-profitability trade-offs, risk and return, as well as resource-based. To the best of the researcher's knowledge, no study had used these concepts and theories in one single study to diagnostically explain, and link the dynamics and antecedents of working capital management and profitability. Moreso, the conceptual framework of

this study which provided the set of IVs over the DV and the control variables co-opted in the model is peculiar to this study. This is also an important academic contribution of this study.

5.4 Managerial and Policy Implications of the Study

The most important managerial/practical contribution of this study could be traced to the findings of the study. The average collection period was found as negatively related with profitability. By implication, the financial managers of Nigerian manufacturing companies are expected to tailor their operations towards ensuring a shorter collection period of the companies' receivables so that it could help in improving profitability. Policies relating to giving discounts and offers to customers that pays back their debt early should be encouraged, so that the collection period will be shorter, this could enhance the chances of higher profitability. The inventory conversion period was found to be negatively related to profitability. Based on this, the financial managers of Nigerian manufacturing companies should ensure a shorter inventory conversion period. The period taken to convert inventories to sales should be made as short as possible, as that is a way of making production, sales and the rate of turnover faster and quicker and consequently higher profitability.

One important managerial implication of this study is that the financial managers of Nigerian manufacturing companies could do better by lengthening their payment period. The companies could delay their payments to the creditors or suppliers, so that the sum of money held could be re-invested and turned over to

make additional gains. This could add to the companies' profitability, since the average payment period was found to be positively related to profitability.

One key managerial / practical contribution of this study is also to the manufacturing companies listed on the Nigerian Stock Exchange. Basically, the 53 manufacturing companies, whose five year financial statements was analyzed with regards to those variables of interest to our study have the opportunity of using the individual ratios computed for the years under consideration. Furthermore, the study could be used by research institutes; co-researchers, incoming researchers as a basis upon which further research can be conducted and the current study could be improved so that the knowledge base is expanded, and more breakthroughs are achieved in the area of working capital management and profitability.

The study could also be considered as an addition to body of knowledge and to series of studies and existing literature conducted globally in the area of working capital management and profitability. It is also expected to add substance to the dearth of literature in this regard especially in sub-Saharan Africa and Nigeria in particular. The relationship of working capital management to profitability among Nigerian listed manufacturing firms appears to be similar to the relationships found in other countries including the developed markets. The next item in this chapter is the study's limitations.

5.5 Limitations of the Study

Notwithstanding the effort put, this study was restrained by several limitations. This section discusses some of the prevailing constraints that were encountered.

Therefore, the results and implications of this study should be considered in the context of the following limitations.

Generalizability of findings: One of the important limitations of this study is the inability of the findings to be generalized in all situations and in all contexts. The findings of this study are confined only to the manufacturing companies. Furthermore, even in the manufacturing, the findings are limited to companies listed on the Nigerian Stock Exchange. Therefore, the findings may not be generalized for the small and medium manufacturing firms not listed on the NSE. More so, the findings of this study are restricted by the economic and political climate of Nigeria. In addition to that, the findings are also confined within the influence of the only control variables employed in the study. Henceforth, generalization of this finding in all contexts, environment and situations may be unrealistic.

Methodological Limitations: The methodology used in this study is panel data approach. However, in spite of the numerous advantages attached to the panel data methodology it still has some limitations. This is so since the panel data contain observations on the same cross-sectional companies over the years 2008-2012, there might be cross-sectional effects on each firm, though fixed effects (FE) and random effects (RE) might have taken care of those constraints. However, the intercepts vary between companies in cross-section, such that each company has a unique, fixed intercept. The differences in intercepts reflect the differences unobserved among cross-sectional units. Those differences could be explained by differences peculiar to different companies for example the company's philosophy or managerial style. Therefore such minor effects which could be purely econometric issues are

considered as minor methodological limitations. Furthermore, this study could be said to be limited by the scope. The span of time of five years 2008-2012 financial statements may be considered as restrictive and therefore a constraint.

In addition to the aforementioned, the researcher relied on the audited financial statements of those manufacturing companies, and as such the results obtained and subsequent findings could be affected by any mistake, omission, error or misrepresentation arising from the financial statements. In addition to the aforementioned, one of the limitations of this study is that the relationship between ACP and profitability was not modelled as non-linear, so was also with other variables like ICP and APP. Therefore having examined the limitations of this study, the next section proffers some recommendations for future research.

5.6 Recommendations for Future Research

Having identified the limitations of this study, this section attempts to proffer recommendations for future studies. These could be aligned as follows:

Control variables: The current study employed only two control variables. That is, the debt ratio and the company size which was measured by the natural logarithm of sales. Future research could introduce other control variables that to the best of researcher's knowledge have not been used in the area of working capital management and profitability. Control variables that are inclined to economic paradigm such as inflation, and openness of the economy could be introduced by future researches. These control variables could help to take care of the inflationary tendencies in the economy.

Dependent variable: The dependent variable for this study is profitability. So has been the case with many studies investigating the impact of working capital management. Few studies made 'performance' as the dependent variable, for instance Padachi (2006). However, even where that was done, the performance was mostly measured by the profitability in terms of financial aspect. In view of this, future research should look at working capital management beyond financial performance or profitability. Accordingly, future research should investigate other non-financial performance measures of working capital management like companies' policies with respect to receivables, inventories and payables since they are vital to performance of companies.

Methodology: The study` s methodological approaches applied are among the many available research techniques. There are other methods for example, the general moment methods (GMM) of estimation that could be employed in future research to produce more accurate overall picture of working capital management and profitability. The general moment method (GMM) is a more sophisticated and latest technique and an advancement to panel data which to the best of the researcher`s knowledge have not been used in the area of working capital management and profitability. Also, future studies should accommodate in their model the non-linear relationship between liquidity and profitability taking into account the potential presence of an optimal level of liquidity. The next item of this chapter shall be the concluding aspect of this thesis.

5.7 Conclusions

Conclusively, the research objectives have been realized and research questions were answered notwithstanding the limitations in the study. The findings answered all the research questions, which directly accomplished the objectives of the study.

However, to be fair to this section of the concluding chapter, let us recollect the individual objectives of this study and relate to the findings. These were:

To investigate the impact of CCC on the profitability of manufacturing companies listed on the NSE.

Findings of the study revealed a significant relationship between the CCC and profitability of manufacturing companies listed on NSE. This signifant relationship was implied, because it was inferred as a result of ICP, ACP and APP being significant.

To evaluate the effect of ACP on the profitability of manufacturing companies listed on NSE.

Finding from the study indicated a significant negative relationship between the ACP and profitability of manufacturing companies listed on NSE. The negative relationship connotes that the shorter the average collection period, the higher the profitability of firms and the longer the ACP the lower the profitability of the firms. Hence, a shorter ACP is more ideal for better profitability.

To investigate the impact of ICP on the profitability of manufacturing companies listed on NSE.

Findings from the study showed a significant negative relationship between ICP and profitability. It therefore implies that the shorter the inventory conversion period the higher the profitability. Also, if the ICP is longer the profitability will be low.

To assess the impact of APP on the profitability of manufacturing companies listed on the NSE.

Findings from the study have empirically established that there was a positive significant relationship between the APP and profitability. It denotes that the longer the APP the higher the profitability. The finding also indicates that if the APP is shorter the profitability will also be lower.

To evaluate the effect of OCATAR on the profitability of manufacturing companies listed on NSE.

Findings from our study, established a negative relationship between OCATAR and profitability in the GPM model only. This negative relationship depicts that a lower OCATAR leads to higher profitability while a higher ratio leads to lower profitability. But there is no consistent significant relationship between OCATAR and the three measures of profitability.

To assess the impact of OCLTAR on the profitability of manufacturing companies listed on NSE.

Findings from the study revealed no significant relationship between OCLTAR and the profitability of manufacturing companies listed on NSE.

To assess the impact of operating cycle on the profitability of manufacturing companies listed on NSE.

Findings from the study revealed that the operating cycle is significantly related to profitability since its components (ICP and ACP) have all been found to be significantly related to profitability.

In addition to the above, this study has also pointed to some important managerial and policy implications. Some of these include the need for financial managers of Nigerian manufacturing companies to device a means of shortening the period for the collection of receivables from debtors (ACP) as well as the time period needed to convert inventories to finished goods, this based on the study's finding could be a catalyst in improving the companies' profitability. Also, Nigerian manufacturing companies should try to extend the period of time for the payment to their creditors for the suppliers (APP) by so doing, the sum held could be re-invested to generate more gains, this could also improve companies' profitability as evidenced by the findings of the study. Based on what has so far been presented in this research and in line with above systematic procedure which to the best of the researcher`s knowledge have been diligently followed, the curtain of this piece of work can now be drawn.

REFERENCES

Afza, T., & Nazir, M. S. (2007). Working capital approaches and firm's returns. *Pakistan Journal of Commerce and Social Sciences, 1*(1), 25-36.

Ajibade, B. L. (2010). *Nigeria and the Economic Reforms.* A paper presented at the Raw Materials Research and Development Centre on 26/11/10, Aguyi Ironsi Street, Maitama, Abuja.

Akinbuli, S. F. (2006). *Financial accounting: Principles and profitability.* Lagos: BPrint Publishers.

Ali, S. (2011). Working capital management and the profitability of the manufacturing sector: A case study of Pakistani textile industry. *The Lahore Journal of Economics, 16*(2), 141-178.

Alipour, M. (2011). Working capital management and corporate profitability: Evidence from Iran. W*orld Applied Sciences Journal, 12*, 1093-1099.

Almeida, H., Campello, M., & Weisbach, M. S. (2002). Corporate demand for liquidity. *NBER Working Paper No. 9253.*

Alreck, P. L., & Settle, R. B. (1995). *The Survey Research Handbook, (2nd ed.),* Chicago: The Irwin Series in Marketing Publishers.

Al-taleb, G., Zoued, A. A., & Sana, A. (2006). Impact of working capital management policy: A case-study of Jordan. *Interdisciplinary Journal of Contemporary Research in Business, 2*(4), 51-60.

Amir, S. S., & Sana, A. (2006). Impact of working capital management on the profitability of oil and gas sector of Pakistan. *European Journal of Scientific Research, 15,* 301-307.

Ananiadis, J., & Varsakelis, N. C. (2008). Capital structure, short-run policy and performance of listed manufacturing firms in Greece. *Journal of Applied Business Research, 24* (3), 45-52.

Appuhami, B. A. (2008). The Impact of firm`s capital expenditure on working capital management: An empirical study across industries in Thailand. *International Management Review, 4*(1), 92-102.

Asterious, D. & Hall, S. G. (2007). Applied Econometrics; Revised ed. New York. Palgrave Macmillan Publishers.

Attari, M. A., & Raza, K. (2012). The optimal relationship of cash conversion cycle with firm size and profitability. *International Journal of Academic Research in Business and Social Sciences, 2*(4), 189-203.

Baltagi, B. (2001*). Econometric analysis of panel data*. Chichester: John Wiley and Sons.

Banos-Caballero, S., Garcia-Terual, P. J., & Martinez-Solano, P. (2010). Working capital management in SMEs. *Accounting and Finance, 50*(3), 511-527.

Bellouma, M. (2011). Effects of capital investment on working capital management: Evidence on Tunisian export small and medium enterprises (SMEs). *African Journal of Business Management, 5*(30), 12133-12137.

Besley, S., & Meyer, R.L. (1991). *An empirical investigation of factors affecting the cash conversion cycle.* Paper presented at the Annual Meeting of Financial Management Association, Les Vegas, Nevada.

Biais, B., & Gollier, C. (1997). Trade credit and credit rationing. *Review of Financial Studies, 10,* 903-937.

Blinder, A. S., & Mancinni, L. (1991). Taking stock: A critical assessment of recent research on inventories. *Journal of Economic Perspectives, 5*(1), 73-96.

Bodie, Z., & Merton, R. C. (2000). *Finance.* Upper Saddle River NJ: Prentice Hall, Inc.

Boyle, G., & Guthrie, G. (2003). Investment, uncertainty and liquidity. *Journal of Finance, 8*(5), 2143-2166.

Brian, B. (2009). Working capital policy and liquidity in small business. *Journal of Small Business Management, 17*(3), 43-51.

Brigham, E. F., & Ehrhardt, M. C. (2004). *Financial management: Theory and practice* (11th ed.). New York: South-Western College Publication.

Bureau for Public Enterprise (2006). *Enterprises Categorization and Sectoral Distribution in Nigeria. A BPE Fact Book on Operations,* Abuja: Government Press.

Cavana, R. Y., Delahaye, B. L., & Sekaran, U. (2001). *Applied business research: Quantitative and Qualitative Methods,* Milton Queensland, Australia: John Wiley and Sons.

Chakraborty, K. (2008). Working capital and profitability: An empirical analysis of their relationship with reference to selected companies in the Indian

pharmaceutical industry. *The ICFAI Journal of Management Research, 10,* 511-521.

Chin, W.W. (1998), 'The Partial Least Squares Approach for Structural Equation Modeling', in Marcoulides, G.A. (Ed). *Modern Methods for Business Research*, Mawah, NJ:Lawrence Erlbaum Associates, 295-336.

Ching, H. Y., Novazzi, A., & Gerab, F. (2011). Relationship between working capital management and profitability in Brazilian listed companies. *Journal of Global Business and Economics. 3*(1), 74-86.

Chiou, J. R., Cheng, L., & Wu, H. W. (2006). The determinants of working capital management. *The Journal of American Academy of Business, 10*(1), 149-155.

Chittenden, F., Poutziouris, P., & Michaelas, N. (1998). Financial management and working capital practices in UK SME`s. *Manchester Business School Journal.*

Chowdhury, A., & Amin, Md. M. (2007). Working capital management practiced in pharmaceutical companies listed in Dhaka Stock Exchange. *BRAC University Journal, 4*(2), 75-86.

Christopher, S. B., & Kamalavalli. A. L. (2009). *Sensitivity of profitability to working capital management in Indian corporate hospitals.* Retrieved from http//www.ssrn.com/abstract 1331500

Churchill, G. A., & Iacobucci, D. (2002*). Marketing Research: Methodological Foundations (8th ed.),* Fort Worth TX: Harcourt College Publishers.

Clearly, S. (1999). The relationship between firm investment and financial status. *Journal of Finance, 4,* 673-692.

Czyweski, A. B., & Hicks, D. W. (1992). Hold on to your cash. *Management Accounting, 1,* 27-30.

Danuletiu, A. E. (2010). Working capital management and profitability: A case of Alba County companies. *Annales Universatatis Apulensis Series Oeconomica, 12*(1), 364-374.

Dash, M., & Hanuman, R. (2012). *A liquidity-profitability trade-off model for working capital management.* Retrieved on 7/5/2012 from http//:www.ssrn.com/abstract= 1408722

Davis, D., & Cosenza, R. M. (1993). *Business research for decision making* (3rd ed.). Belmot, CA: Wardsworth Publishing Company.

Deloof, M. (2003). Does working capital management affect profitability of Belgian firms? *Journal of Business, Finance and Accounting, 30*(3-4), 573-587.

Deloof, M. (2001). Belgian intragroup relations and the determinants of corporate liquid reserves. *European Financial Management, 7*(3), 375-392.

Dhar, P. (2011). Working capital policy: An empirical inquest on its determinants with reference to some selected public sector companies in India. *Journal of Radix International Educational Research Consortium, 1*(1), 1-19.

Dittmar, A., Mahrt-Smith, J., & Servaes, H. (2003). International corporate governance and corporate cash holdings. *Journal of Financial and Quantitative Analysis, 38*(1), 111-133.

Dong, H. P., & Su, J. F. (2010). The relationship between working capital management and profitability: A Vietnam case. *International Research Journal of Finance and Economics, 49,* 56-68.

Eljelly, M.A. (2004). Liquidity-profitability trade-off: An empirical investigation in an emerging market. *International Journal of Commerce and Management, 14*(2),202-218.

Emory, C.W., & Cooper, D.R. (1991). *Business Research Methods* (4th ed.). Homewood IL: Richard D. Irwin.

Enqvist, J., Graham, M., & Nikkenen, J. (2012). *The impact of working capital management on firm profitability on different business cycles: Evidence from Finland.* Retrieved on 4/7/2012 from http//ssrn.com/1794802

Falope, O. I., & Ajilore, O.T. (2009). Working capital management and corporate profitability: Evidence from the panel data analysis of selected quoted companies in Nigeria. *Research. Journal of Business Management, 3*, 73-84.

Filbeck, G., & Krueger, T. (2005). Industry related differences in working capital management. *Mid-American Journal of Business, 20*(2), 11-18.

Fink, A. (1995). *How to sample in surveys.* Thousand Oaks CA: Sage Publication.

Gallinger, G. W., & Healey, P. B. (1991). *Liquidity analysis and management* (2nd ed.). Reading MA: Addison-Wesley Publishing Company, Inc.

Ganesan, V. (2007). An analysis of working capital management efficiency in telecommunication equipment industry. *Ravier Academic Journal, 3*(2), 1-10.

Garcia-Terual, P. J., & Martinez-Solano, P. (2007). Effects of working capital management on SME profitability. *International Journal of Managerial Finance, 3,* 164-177.

Gardner, M. J., Mills, D. L., & Pope, R. A. (1986). Working capital policy and operating risk: An empirical analysis. *Financial Review, 21*(3), 31.

Gentry, J.A., Vaidyanathan, R., & Lee, H.W. (1990). A weighted cash conversion cycle. *Financial Management, 19*(1), 90-99.

Ghosh, S. K., & Maji, S. G. (2003). Working capital management efficiency: A study on the Indian cement industry. *The Management Accountant, 39*(5), 363-372.

Gill, A., Biger, N., & Mathur, N. (2010). The relationship between working capital management and profitability: Evidence from the United States. *Business and Economics Journal, 10*, 1-9.

Gitman, L. A. (2005). *Principles of management finance* (11th ed.). New York: Addison Wesley Publishers.

Gitman, L. J. (1974). Estimating corporate liquidity requirements: A simplified approach. *The Financial Review, 9*(1), 79-88.

Gombola, M. J., & Ketz, J. E. (1983). Financial ratio patterns in retail and manufacturing organizations. *Financial Management, 12*(2), 45-46.

Greene, W. (2008). *Econometric analysis* (6th ed.). USA: Pearson Prentice Hall Publishers.

Gundavelli, V. (2006). Treasury: Working capital: Seven steps working. *Financial Executives, 22*(4), 52-54.

Hair, J.F., Black, W.C., Babin, B.J., & Anderson, R.E. (2010). *Multivariate Data Analysis* (7th ed.). U.S.A.: Peason Prentice Hall Publishers.

Haranji, Y. (2013). *On-shore, off-shore and the Nigeria`s oil market.* A paper presented at 3rd Symposium on Oil and Oil Products, on 9th Jan., 2013 at Agura Hotel, Area 10, Garki, Abuja.

Harris, A. (2005). Working capital management: Difficult but rewarding. *Financial Executives, 21*(4), 52.

Hawawini, G., Viallet, C., & Vora, A. (1986). Industry influence on corporate working capital decisions. *Sloan Management Review, 27*(4), 15-24.

Hill, M. D., Kelly, G. W., & Highfield, M.J. (2010). Net operating working capital behaviour: A first look. *Financial Management, 39,* 783-805.

Hill, N. C., & Sartoris, W. L. (1995). *Short term financial management: Texts and cases* (3rd ed.). Englewood Cliffs, NJ: Prentice Hall, Inc.

Hofstede, G. H. (1984). *Culture's consequences: International difference in work-related values.* (Abridged ed.). Newbury Park, California: Sage Publication.

Howorth, G., & Westhead, P. (2008). The focus of working capital management in UK small firms. *Management Accounting Research Journal, 14*(2), 94-111.

Hsiao, C. (2003). *Analysis of panel data.* (2nd ed.). Cambridge: University Press.

Huizingh, E. (2007). *Applied statistics with SPSS.* London: Sage Publication.

Hussain, A., Farooq, S. U., & Khan, K. U. (2012). Aggressiveness and conservativeness of working capital: A case of Pakistani manufacturing sector. *European Journal of Scientific Research, 73*(2), 171-182.

Hussey, J., & Hussey, R. (1997). *Business research: A practical guide for undergraduate and postgraduate students*. London: Macmillan Press Limited.

Imran, O. C., & Nousheen, A. N. (2010). Relationship between efficiency level of working capital management and profitability of firms in the textile sector of Pakistan. *Indus Journal of Management and Social Sciences, 4*(1), 30-42.

Jarvis, R., Kitching, J., Curran, J., & Lightfoot, G. (1996). The financial management of small firms: An alternative perspective. *International Small Business Journal, 9*(2), 54-63.

Jensen, M. C. (1986). Agency costs of free cash flow, corporate finance and takeovers. *American Economics Review, 76*(2), 323-329.

Jose, M. L., Lancaster, C., & Stevens, J. L. (1996). Corporate returns and cash conversion cycle. *Journal of Economics and Finance, 20*(1), 33-46.

Kaddumi, T. A., & Ramadan, I. Z. (2012). Profitability and working capital management: The Jordanian case. *International Journal of Economics and Finance, 4*(4), 217-226.

Karaduman, H. A., Akbas, H. E., Ozsozgun, A., & Durer, S. (2010). Effects of working capital management on profitability: The case of selected companies in Istanbul Stock Exchange (2005-2008). *International Journal of Economics and Finance Studies, 2*(2), 47-54.

Kargar, J., & Blumenthal, R. A. (1994). Leverage impact on working capital in small business. *TMA Journal, 14*(6), 46-53.

Khan, Z., Jawaid, S. T., Arif, I., & Khan, M. N. (2012). Working capital management and firm profitability in Pakistan: A disaggregated analysis. *African Journal of Business Management, 6*(9), 3253-3261.

Kim, C., Mauer, D. C., & Sherman, A. E. (1998). The determinants of corporate liquidity: Theory and evidence. *Journal of Financial and Quantitative Analysis, 33*, 335-359.

Knight, F. (1921). *Risk, uncertainty and profit* (3rd ed.). Boston: Mifflin Company.

Lamberson, M. (1995). Changes in working capital of small firms in relation to changes in economic activity. *Journal of Business, 10*(2), 45-50.

Lazaridis, I., & Tryfonidis, D. (2006). Relationship between working capital management and profitability of listed companies in Athens Stock Exchange. *Journal of Financial Management and Analysis, 19*, 26-35.

Long, M. S., Malitz, I. B., & Ravid, S. A. (1993). Trade credit, quality guarantees and product marketability. *Financial Management, 22*(4), 117-127.

Lyroudi, K., & Lazaridis, T. (2000). *The cash conversion cycle and liquidity analysis of the food industry in Greece.* Retrieved on 15/11/2012 from http//papers.ssrn.com/abstract 236175.

Manufacturers Association of Nigeria (2011). Industries Categorization in Nigeria. A Quarterly Bulletin of MAN, April-June, 2011. Abuja, Nigeria.

Marcia, M. C., Troy, A. A. & John, N. (2012). Finance; Application and Theory. 2nd ed. McGraw-Hill Publishers.

March, G. J. (1994). *A primer on decision making: How decision happen* (2nd ed.). New York: The Free Press.

March, J. G., & Simon, H. A. (1958). *Organizations.* New York: Wiley Press.

Mathuva, D. M. (2010). The influence of working capital management components on corporate profitability: A survey on Kenyan listed firms. *Research Journal of Business Management, 4*(1), 1-11.

Maxwell, C. E., Gitman, L. J., & Smith, S. A. M. (1998). Working capital management and financial service consumption preferences of US and foreign

firms: A comparison of 1979 and 1996 preferences. *Financial Practice and Education, 8*(2),46-52.

Meric, I., Prober, L. M., Eichhorn, B. H., & Meric, G. (2004). Integration and the financial characteristics of manufacturing firms in the European Union. *American Business Review Journal, 22*(2), 89-96.

Mian, S. L. & Smith, C. W. (1992). Accounts receivable management policy and evidence. *Journal of Finance, 42*(4), 429-437.

Michalski, G. (2012). *Liquidity or profitability: Financial effectiveness of investments in working capital.* Retrieved from http: michalkig.u.e.wroc.p1/ on 16/10/2012.

Mike, J. A. (2010). *The structure of the Nigerian manufacturing industry.* A paper presented at the National Workshop on Strengthening Innovation and Capacity Building in the Nigerian Manufacturing Sector, on 20-21, July, 2010, at Sheraton Hotel and Towers, Ikeja, Lagos, Nigeria.

Molem, C.S. (1997). *The structure of the Nigerian economy* (1st ed.). Zaria, Ahmadu Bello University, Zaria, Press, Nigeria.

Moles, P., Parriso, R., & Kidwell, D. (2011). *Corporate Finance* (European ed.). John Wiley and Sons.

Montgomery, D. C., Peck, E. A. & Vinning, G. G. (2001). *Introduction to linear regression analysis*. 3rd ed. New York. John Wiley Publishers.

Moradi, M., Salehi, M., & Arianpoor, A. (2012). A comparison of working capital management of chemical and medicine listed companies in Tehran Stock

Exchange. *International Journal of Business and Behavioural Sciences, 2*(5),62-78.

Moss, J., & Stine, B. (1989). Liquidity characteristics of small and large manufacturing firms. *Managerial Finance, 15*(6), 62-78.

Moyer, R. C., McGuigan, J. R., & Kretlow, W. J. (2005). *Contemporary financial management* (10th ed.), New York: South-Western College Publication.

Mueller, F. W. (1953). Corporate working capital and liquidity. *The Journal of Business of the University of Chicago, 26*(3), 157-172.

Mukherji, A., Desai, A. B., & Wright, P. (2008). *A contingent relationship between risk and return: Towards a behavioural model of decision making.* Institute of Behavioural and Applied Management.

Mullen, D. J., & Roth, B. (1991). *Decision making: Its logic and practice savage, MD (3rd ed.).* UK: Rowman and Littlefield Publishers, Inc.

Narware, P. C. (2004). Working capital and profitability: An empirical analysis. *The Management Accountant, 39*(6), 120-127.

National Bureau for Statistics (2010). Factbook of the Federal Office of Statistics. Garki, Abuja, Nigeria: Government Press.

National Population Commission of Nigeria (2007). Bulletin on Report of the National Census, 2006. Wuse, Abuja, Nigeria: Government Press.

Nazir, M. S., & Afza, T. (2009). The impact of aggressive working capital management policy on firms profitability. *The IUP Journal of Applied Finance, 15*(8), 19-31.

Nigeria National Petroleum Corporation (2012). *The NNPC Standing: Official Monthly Bulletin of NNPC, Nov., 2012.* Abuja. Nigeria: NNPC Press.

Nigerian Stock Exchange (2012). *NSE Fact Book, on History and Operations.* Abuja, Nigeria: Government Press.

Nobanee, H., Abdullatif, M., & Al-hajjar, M. (2010). *Cash conversion cycle and firm`s performance of Japanese firms.* Retrieved from www.ssrn.com on 16/11/2012.

Nobanee, H., & Al-hajjar, M. (2012). Optimizing working capital management. *Social Science Research Network, dostepne na, retrieved from http:// papers.ssrn.com*

Nor Edi, A. B. M. & Noriza, B. M. S. (2010). Working capital management: The effects of market valuation and profitability in Malaysia. *International Journal of Business and Management, 5*(11), 140-147.

Noryati, A., Hamisah, A. R. & Zainora, A. W. (2012). Fundamental of Finance. 2nd ed. Oxford University Press Publishers.

Olubukunola, U., Uwaigbu, U., & Ben-caleb, E. (2012) Cash management and corporate profitability. A case study of selected listed manufacturing firms in Nigeria. *The Economic Journal 8*(1).

Opler, T., Pinkowits, L., Stulz, R., & Williamson, R. (1999). The determinants and implications of corporate cash holdings. *Journal of Financial Economics, 5*(1), 3-46.

Osisioma, B. C. (1997). Sources and management of working capital. *Journal of Management Science, 2*(1), 78-89.

Oyeyinka, B. O., Laditan, G. O. A., Esubiyi, A. O. (1996). Industrial innovation in sub-saharan Africa; The manufacturing sector in Nigeria. *Research Policy, 27(7),* 1081-1096.

Ozbayrak, M., & Akgiin, M. (2006). The effects of manufacturing control strategies on the cash conversion cycle in manufacturing systems. *International Journal of Production Economics, 103,* 535-550.

Padachi, K. (2006). Trends in working capital management and it`s impact on firm`s performance: An analysis of Mauritian small manufacturing firms. *International Review of Business Research Papers, 2*(2), 45-58.

Pinches, G. E. (1994). *Financial management* (4th ed.), UK: Harper Collins College Publishers.

Poiters, P. (2004). Working capital management and company value at Heinz, Northern Europe. *Treasury Affairs, 1*(2), 6-13.

Prasana, C. (2000). *Financial management*. McGraw Publishing Company.

Rafuse, M.E. (1996). Working capital management: An urgent need to re-focus. *Journal of Management Decision, 34*(2), 59-63.

Raheeman, A., Afza, T., Qayyum, A., & Bodla, M. A. (2010). Working capital management and corporate performance of manufacturing sector in Pakistan. *International Research Journal of Finance and Economics, 47,* 151-163.

Raheeman, A., & Nasr, M. (2007). Working capital management and profitability: Case of Pakistani firms. *International Review of Business Research Papers, 3,* 279-300.

Ramachandran, A., & Janakiraman, R. (2009). The relationship between working capital management efficiency and EBIT. *Managing Global Transactions, 7*(1), 61-74.

Ramana, N. V., Azash, S. M. D., & Krishnaiah, K. R. (2012). A study on impact of working capital on profitability performance: An investigation in Andhra Cement Ltd. *African Journal of Business Management, 5*(7), 3174-3192.

Rao, R. (1989). Fundamentals of financial management (3rd ed.). USA: Macmillan Publishers,

Rehman, A. (2006). *Working capital management and profitability: Case of Pakistani firms.* Unpublished dissertation. COMSATS Institute of Information Technology Islamabad, Pakistan.

Richards, A. B., Stewart, C. M., & Franklin, A. (2008*). Principles of corporate finance* (9th ed.). New York: Wiley and Sons.

Richards, V. D., & Laughhin, E. J. (1980). A cash conversion cycle approach to liquidity analysis. *Financial Management, 9*(1), 32-38.

Ross, S. A., Westerfield, R. W., & Jeffrey, J. (2005). *Corporate finance* (7th ed.). UK:McGraw Hill.

Saccurato, F. (1994). The study of working capital. *Business Credit Journal, 96,* 36-37.

Sathamoorthi, C. R (2002). The management of working capital in selected co-operatives in Bostwana. *Finance India, Delhi, 16,* 1015-1034.

Sayaduzzaman, M. d. (2006). Working capital management: A study on British-American Tobacco Bangladesh Company Ltd. *The Journal of Nepalese Business Studies, 3*(1), 78-84.

Schein, J. (2009). *The cash conversion cycle.* Retrieved from www.companyworkshop.com on 16/10/2013.

Securities and Exchange Commission. (2012). *Listing and Requirements*. An annual publication of Investment Department, SEC Towers Central Business District, Abuja, Nigeria.

Sekaran, U. (2004). *Research methods for business: A skill building approach* (4th ed.). U.S.A.: John Wiley and Sons.

Sekaran, U., & Bougie, R. (2009). *Research methods for business: A skill building approach* (5th ed.). London: John Wiley and Sons.

Shin, H. H., & Soenen, L. (1998). Efficiency of working capital management and corporate profitability. *Financial Practice and Education, 8*(2), 37-45.

Singh, P. (2008). Inventory and working capital management: An empirical analysis. *The Icfai Journal of Accounting Research, 7*(2), 53-73.

Singh, J. P., & Panday, S. (2008). Impact of working capital management on the profitability of Hindalco Industries Limited. *The Icfai University Journal of Financial Economics, 6*(4), 62-67.

Skomp, S. E., & Edwards, D. E. (1978). Measuring small business liquidity: An alternative to current and quick ratios. *Journal of Small Business Management, 16*(2), 22-26.

Smith (1980). Profitability versus liquidity trade-offs in working capital management. In *Readings on The Management of Working Capital*. New York: West Publishing Company.

Smith, B. M., & Begemann, E. (1997). Measuring association between working capital and return on investment. *South African Journal of Business Management, 28*(1), 1-5.

Soderbom, M., & Teal, F. (2011). *The performance of Nigerian manufacturing firms*. A publication of the United Nations Industries Development Organization (UNIDO) and the Center for Study of African Economics, Department of Economics, University of Oxford, U.K.

Soenen, L.A. (1993). Cash conversion cycle and corporate profitability. *Journal of Cash Management, 13*(4), 53-58.

ThisDay Newspaper Report. Retrieved from www.thisdaylive.com/articles/manufacturing-sector- slows-in-nigeria-others-unido/ 125905

Tiegen, H. K., & Brun, W. (1997). *Anticipating the future: Appraising risk and uncertainty*. New York: Routledge Dress Publishers.

Tybout, J. R. (2000). Manufacturing firms in developing countries: How well do they do and why? *Journal of Economic Literature, 38*, 11-14.

Ukaegbu, B. (2014). The significance of working capital management in determining firm profitability; Evidence from developing economies in Africa. *Research in International Business and Finance, 31*, 1-16.

Uremadu, S. O., & Egbide, B. P. E. (2012). Liquidity and corporate profitability among quoted firms in Nigeria: Evidence from the productive sector. *International Journal of Academic Research in Accounting Finance and Management Science, 2*(1).

Uyar, A. (2009). The relationship of cash conversion cycle with firm size and profitability: An empirical investigation in Turkey. *International Research Journal of Finance and Economics, 24,* 168-193.

Vaidyanathan, G. J. A., Lee, R., & Wai, H. (1990). A weighted cash conversion cycle. *Financial Management Journal, 19*(1), 90-99.

Van Horne, J. C., & Wachwiczs, J. M. (2004). *Fundamentals of financial management* (12th ed.). New York: Prentice Hall, Publishers.

Vishani, S. (2007). Impact of working capital management policies on corporate performance: An empirical study. *The Management Accountant, ICWAI, Kolkata, 1,* 748-750.

Vogt, W. P. (1993). *Dictionary of statistics and methodology: A non-technical guide for the social sciences.* London: Sage Publication.

Weinraub, H. J., & Visscher, S. (1998). Industry practice relating to aggressive-conservative working capital policies. *Journal of Financial and Strategic Decision, 11*(2), 11-18.

Williams, A., & Heins, R. (1964). *Risk management and insurance* (2nd ed.). New York: McGraw Hill, Publishers.

Williamson, O. E. (1984). Corporate governance. *Yale Law Review, 93,* 1197-1230.

Zainudin, N. (2009). Trade credit practices of Malaysian small and medium sized enterprises in the manufacturing sector. Unpublished PhD Thesis, University of New England, Australia.

Zainudin, N. (2006). Liquidity-profitability trade-off: Is it evident among Malaysian SMEs? *International Journal of Management Studies, 13*(2), 107-118.

Zariyawati, M. A., Annuar, M. N., Taufiq, H., & Abdul Rahim, A. S. (2009). Working capital management and corporate performance: Case of Malaysia. *Journal of Modern Accounting and Auditing, 5*(11), 47-54.

Zubairi, H. J. (2010). *Impact of working capital management and capital structure on profitability of automobile firms in Pakistan.* Retrieved from www.ssrn.com on 16/01/2013.