

**THE RELATIONSHIP BETWEEN WORKING CAPITAL MANAGEMENT
AND PROFITABILITY OF MANUFACTURING FIRMS LISTED AT THE
NAIROBI STOCK EXCHANGE**

BY

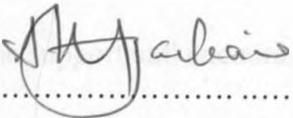
SAMUEL M. KWERI

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THE REQUIREMENTS FOR THE DEGREE OF MASTER OF BUSINESS
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DECLARATION

This research project is my original work and has not been presented for a degree award in any other University.

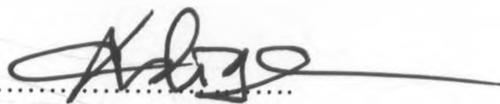
Signed 

S M Kweri

D61/70003/2009

Date. 11th November 2011

This research project has been submitted for examination with my approval as the University Supervisor.

Signed 

Herick O. Ondigo (Supervisor)

Lecturer, School of Business

University of Nairobi.

Date. 12th Nov 2011

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God bless you all.

DEDICATION

This research project is dedicated to my family for their inspiration, encouragement, understanding and prayers towards the successful completion of this course. I pay glowing tribute and gratitude to the Almighty God who has given me the wisdom to undertake this course.

ABSTRACT

Working capital management is undoubtedly one of the most crucial aspects of financial management. This study examined the relationship between working capital management and profitability of manufacturing firms listed at the Nairobi Stock Exchange. To achieve this objective, the study used secondary data obtained from the annual reports and financial statements of manufacturing companies listed on the NSE for the period 2006-2010. A sample of 17 companies was selected but the firms that were analyzed after the screening process finally became 14. A regression model was determined to establish the relationship between net operating profit and the working capital variables namely, average collection period, inventory holding period, average payment period and cash conversion cycle. The control variables that were used included the age and leverage of the firms. Pearson's correlation and regression analysis were used for the analysis and tests of significance were carried out for all variables using t-test at the 95% level of significance.

The results indicate that the model examined in this study is significant with an adjusted R^2 of 56.4% and also that all the independent variables had a significant relationship individually with the NOP. The results further show that there is a strong negative relationship between average collection period, inventory holding period and cash conversion cycle. This is consistent with the view that the time lag between expenditure for purchases of raw material and the collection of sales of finished goods can be too long and that decreasing this time lag increases profitability. This suggests that managers can create value for their shareholders by reducing the number of days accounts receivable and inventories to a reasonable minimum. On the other hand, a positive correlation between the net operating profit and the accounts payment period, the age of the firm

and the debt used by the firm was found, indicating that if the firm could lengthen these variables, then it would increase its profitability.

The study concluded that working capital management affects profitability of the company and if the firm can effectively manage its working capital, it can lead to increasing profitability. Therefore, it will be important for a firm's management to understand the relationship that exists between various working capital components and profitability and the direction that they affect the profit for effective management of the working capital.

LIST OF ABBREVIATIONS

ACP	Accounts Collection Period
AGOA	African growth opportunity Act
ANOVA	Analysis of variance
APP	Accounts Payment Period
ASE	Athens Stock Exchange
CCC	Cash conversion cycle
COMESA	Common market of East and Southern Africa
DSO	Days sales outstanding
EAC	East Africa Community
GDP	Gross Domestic Product
IHP	Inventory Holding Period
ISE	Istanbul Stock Exchange
KAM	Kenya Association of Manufacturers
NOP	Net Operating Profit
NSE	Nairobi Stock Exchange
ROA	Return on Assets
ROE	Return on Equity
SME's	Small and Medium Enterprises
SPSS	Statistical Package for Social Sciences
WCM	Working Capital Management

TABLE OF CONTENTS

DECLARATION	ii
ACKNOWLEDGEMENTS.....	iii
DEDICATION.....	iv
ABSTRACT	v
LIST OF ABBREVIATIONS.....	vii
TABLE OF CONTENTS.....	viii
LIST OF TABLES.....	xi
CHAPTER 1	
INTRODUCTION	
1.1 Background.....	- 1 -
1.1.1 Manufacturing Firms in Kenya	- 3 -
1.2 Research Problem	- 5 -
1.3 Objectives of the Study.....	- 8 -
1.4 Value of the Study	- 8 -
CHAPTER TWO	
LITERATURE REVIEW	
2.1 Introduction.....	- 10 -
2.2 Defining Working Capital Management	- 10 -
2.3 Theories of Working Capital Management	- 13 -
2.3.1 Matching Approach.....	- 13 -

2.3.2	Aggressive Approach	- 14 -
2.3.3	Conservative Approach	- 15 -
2.4	Effect of Working Capital on Profitability	- 15 -
2.5	Performance Measures.....	- 19 -
2.5.1	Financial Measures.....	- 20 -
2.5.2	Non-Financial Measures.....	- 23 -
2.6	Empirical Review	- 25 -
2.7	Conclusion	- 25 -

CHAPTER THREE

RESEARCH METHODOLOGY

3.1	Introduction.....	- 30 -
3.2	Research Design	- 30 -
3.3	Population of the Study	- 31 -
3.4	Sample and Sampling Procedure	- 31 -
3.5	Data Collection	- 32 -
3.6	Variables and Variable Measurement.....	- 32 -
3.6.1	Average Collection Period (ACP).....	- 32 -
3.6.2	Inventory Holding Period (IHP).....	- 32 -
3.6.3	Average Payment Period (APP).....	- 33 -
3.6.4	Cash Conversion Cycle (CCC).....	- 33 -
3.6.5	Leverage Ratio (LEV).....	- 33 -

3.6.6 Age of the Firm (AGE)	- 34 -
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CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction.....	- 35 -
4.2 Results.....	- 35 -
4.3 Descriptive Analysis	- 35 -
4.4 Quantitative Analysis.....	- 37 -
4.4.1 Pearson and Spearman's Correlations	- 37 -
4.4.2 Regression Analysis.....	- 41 -
4.5 Discussion of Findings	- 43 -

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction.....	- 44 -
5.2 Summary	- 44 -
5.3 Conclusions.....	- 45 -
5.4 Recommendations.....	- 46 -
5.5 Limitations of the Study.....	- 46 -
5.6 Suggestions for Further Research.....	-47-
REFERENCES	- 48 -
APPENDIX I Manufacturing Firms Listed at the NSE.....	-53-
APPENDIX II Source Data	- 54 -

LIST OF TABLES

Table 1 : Summary Statistics	36
Table 2 : Pearson and Spearman's Correlation Coefficient.....	38
Table 3 : Results of General Least Squares	41
Table 4 : Model Summary for NOP with Control Variables.....	42

CHAPTER ONE

INTRODUCTION

1.1 Background

The management of working capital is an important component of the finance function. This is because working capital of a firm directly affects the liquidity and profitability of the company. The working capital management deals with the management of current assets and current liabilities. The importance of a proper management of working capital stems from the fact that majority of manufacturing firms have their current assets accounting to over half of the total assets and the proportion could even be higher for a distribution company.

According to Van Horne and Wachowicz (2000), excessive levels of current assets can easily result in a firm realizing a substandard return on investment and at the same time, too few current assets may incur shortages and difficulties in maintaining smooth operations of a firm. Thus, efficient management of the working capital becomes an important function of a finance manager just like the financing, investment and dividend policy function. Indeed as was observed by Rao (1989), managers spend considerable time on day-to-day problems that involve working capital decisions. Eljelly (2004) defined efficient working capital management practice to involve planning and controlling current assets and current liabilities in a manner that eliminates the risk of inability to meet due short term obligations on the one hand and also avoid excessive investment in these assets on the other hand. A firm is also responsible for meeting its obligations whether short or long term on timely basis. However, liquidity for an on-going firm

is not reliant on the liquidation value of its assets, but rather on the operating cash flows generated by those assets (Soenen, 1993). According to Joshi (1994), Working Capital Management is a very sensitive area in the field of financial management because it involves the decision of the amount and composition of current assets and the financing of these assets. The level of working capital in a firm in part affects its profitability and therefore it becomes imperative that an organization should endeavor to maintain an optimal level at any given time. Maximization of the shareholder wealth still remains the ultimate objective of any firm. However, in order to achieve this objective, a firm should also maximize its profits. Preserving the liquidity of a firm is equally an important objective and as such a firm should balance among the different interest objectives. However, increasing profits at the cost of liquidity can bring serious problems to the firm and a trade off between these two objectives of the firm needs to be struck. One objective should not be at the cost of the other because both have their importance. If a firm does not care about profit, it will not survive for a longer period. On the other hand, if it does not care about liquidity, it may face the problem of insolvency or bankruptcy. For these reasons working capital management should be given proper consideration and will ultimately affect the profitability of the firm.

Efficient working capital management involves planning and controlling current assets and current liabilities in a manner that eliminates the risk of the inability of firm to pay its short term obligations when they fall due and to avoid the excessive investment in these assets on the other hand (Eljelly, 2004). This is because too much working capital reduces risk and return, while too little working capital increases risk and return (Ross, Westerfield & Jaffee, 1996). Managers spend considerable time on day to day problems that involve working capital decisions

(Rehaman & Nasr, 2007). This is because current assets are short term investment that is continually being converted to other forms of assets. With regard to current liabilities, a firm is responsible to paying these debts on timely basis. Taken together, decisions on current assets and liabilities become frequent, repetitive and time consuming (Appuhami, 2008). Working capital management involves the decision on the amount of current assets and the financing of these assets. Current assets involve those classes of assets that can be converted to cash easily and normally within a period of one year and such temporary investment that can be converted to cash upon need (Rehaman & Nasr, 2007).

A firm's management of its working capital can have a significant effect on its profitability (Deloof, 2003). Decisions that tend to maximize profitability tend to minimize the level of current assets carried. On the other hand, focusing entirely on liquidity will tend to reduce the potential profitability of the firm. A firm can have a large sales level through adopting a generous credit policy and thus extending the cash conversion cycle though the action may increase the level of profitability. However, the traditional view of the relationship between a firms working capital level is such that, all other factors remaining constant, the longer cash conversion cycle hurts the profitability of the firm (Deloof, 2003). This therefore requires that the level of working capital that a firm maintains need to be kept at an optimum point that will maximize the profits.

1.1.1 Manufacturing Firms in Kenya

Kenya manufacturing sector is the fourth biggest sector after agriculture, transport and communication, and wholesale and retail trade. It contributed about 10.1 per cent of Kenya's

GDP serving both the local market and exports to the East African region. The sector, which is dominated by subsidiaries of multi-national corporations, contributed approximately 18% of the Gross Domestic Product (GDP) in 2009. Improved power supply, increased supply of agricultural products for agro processing, favorable tax reforms and tax incentives, more vigorous export promotion and liberal trade incentives to take advantage of the expanded market outlets through AGOA, COMESA and East African Community (EAC) arrangements, have all resulted in a modest expansion in the sector of 1.5 per cent in 2008 as compared to 1.2 per cent in 2007.

Although initially developed under the import substitution policy, Kenya's manufacturing sector is now export based in line with the country's policy of emerging as a mid-sized economy in the year 2030. The sector is loosely classified into 12 sub-categories based on the raw materials the companies import and or the products they manufacture. The individual firm members are organized under the membership of Kenya Association of Manufacturers (KAM) to give them a platform for negotiating common position with the relevant government authorities.

Challenges facing the sector include shrinking demands for locally manufactured goods due to rising poverty levels and reduced exports resulting from general economic slump after the recent global recession. In addition, the high cost of inputs resulting from poor infrastructure has led to high prices for final products leading to underutilization of capacity. The erratic and high cost of energy has also had a negative impact. Other challenges include security issues, arbitrary charges levied by regulatory and local authorities and high cost of securing financial facilities from the banks. However opportunity for growth exists with the rollout of common tariff under

the newly integrated EAC custom union, because Kenya's manufacturing sector is the largest in the region. As at the end of 2010, there were seventeen (17) manufacturing firms listed in the Nairobi Stock Exchange with the price movement of 5 of them being used to determine the daily average NSE index.

1.2 Research Problem

The management of a firm's liquidity is necessary for all businesses, small, medium or large. When a business does not manage its liquidity well, it will have cash shortages and as a result experience problems paying its obligations when they fall due. Indeed, working capital starvation has generally been credited as a major cause, if not the main cause of small business failure in many developed and developing countries (Rafuse, 1996). The importance of an effective management of working capital is further necessitated by the present unpredictable business environment. With the high level of competition from both local and international competitors, the predictability of a firm's ability to meet its short term obligations when they fall due becomes of great importance. Effective management of working capital in a firm should aim at ensuring that the firm has the ability to continue operating with sufficient cash flow for payment of both maturing short-term debt and impending operational expenses (Mathuva, 2010). This process will require further that cash collection from customers is made in time so that the firm has no difficulty in paying its current liabilities. As much as a good level of current assets is necessary to pay off the current liabilities of a firm, too much of these assets will impact negatively on the profitability of the firm. Hence it becomes imperative that a firm identifies the optimal level of working capital at any time that it will carry. This therefore highlights the importance of managing working capital requirements of a firm to ensure an improvement in firm's market

value and profitability and this aspect must form part of the company's strategic and operational thinking in order to operate effectively and efficiently.

The Kenyan manufacturing sector is considered as one of the key segments of the economy. According to the KAM, the manufacturing sector employs more than 1.5 million employees. In addition, the Kenyan vision 2030 blue print, one of the key pillars of the attainment of the objectives of the strategy is the need for the manufacturing sector to grow at the rate of 8% over a period of 20 years. This can only be achieved if there is growth in the profits of the sector and this will be dependent upon identifying all the variables that can influence profits of a firm including the management of working capital. The bulk of the cost of goods sold of a manufacturing firm is raw material and labor. These elements by virtue of their level, will ordinarily lead to high level of payables and accruals that will have to be paid. The inability of a firm to meet its obligations will lead to the disruption of its manufacturing process by actions such as labor strikes and blacklisting by suppliers.

The strategic importance of working capital management has ignited various researchers to focus on evaluating the working capital management and profitability relationships. The studies include those by Uyar (2009); Samiloglu and Demirgunes (2008) and Vishnani and Shah(2007).

With reference to Kenya, a number of studies have been conducted locally on how various financial elements impact on the firm's profitability. Several researches have been done locally on how various variables affect the profitability of firms. Kimani (2009) undertook a research on the relationship between firm's profitability and its size and the book to market value: Evidence from the NSE. She found out that the growth in sales of a firm is positively related to the firm

profitability. She further concluded that a firm that manages to increase its sales output improves its revenue and as a result having more funds available for further expansion. On his part Nganga (2009) studied the relationship between working capital and profitability of listed companies at the NSE. The study found out that managers can create value if they adopt a conservative approach towards working capital investment and working capital financing policies. It was also found out that investors have a positive opinion on those firms that adopt an aggressive approach to managing their short-term liabilities. In contrast to these studies that looked at all firms listed at the NSE, this study attempted to find the relationship that exist on a particular market segment in the economy to come up with a specific relationship that exist between working capital management and profitability of manufacturing firms quoted at the NSE. The main motivating force to undertake the study was the apparent lack of empirical evidence on existing literature, regarding working capital management and its impact on firm performance on a sectoral basis, with reference to Kenya.

The Kenyan manufacturing sector, on which limited research work has been done, is not comparable to those firms in the developed world or middle income countries where the empirical studies have been conducted and as a result, the researcher believes that there might be differences on the relationship between the working capital management and the firm's performance. Furthermore, different industries and lines of business will have different Working capital requirements because of differing operating or business characteristics across industries. Hence, what may be considered acceptable level of working capital for one sector may be unacceptable in another. Manufacturing firms invest heavily in the various working capital components and it would be interesting to study how this impacts on their performance.

1.3 Objectives of the Study

To establish a relationship between Working Capital Management and Profitability of Manufacturing firms listed at the NSE.

1.4 Value of the Study

To Policy Makers and Regulators

The understanding of the impact that working capital has on the profitability of a firm will help policy makers – governments and other stakeholders – to design targeted policies and programs that will actively stimulate the growth and sustainability of the manufacturing firms in the country, as well as helping those policy makers to support, encourage, and promote the establishment of these firms. Regulatory bodies such as KAM, Capital Markets Authority and the Kenya Revenue Authority can use the study findings to improve on the framework for regulation.

To Managers of Manufacturing Firms

The study findings will benefit management and staff of manufacturing firms who will gain insight into how their institutions can effectively manage their working capital. This study will offer an understanding on the importance of maintaining an optimal working capital and postulating the relationship that exist between the existing level of working capital and the profit level. Several policies on the management of working capital that various manufacturing firms can adopt will also be addressed. This is because manufacturing firms need to adapt to the changing needs of the current business set up and requirement of various suppliers and providers

of services. As a result, manufacturing firms in the country and other affiliated firms will derive great benefit from the study.

To Researchers and Scholars

This study will also create a monograph which could be replicated in other sectors of the economy. Most importantly, this research will contribute to the literature on the relationship between working capital management and profitability. It is hoped that the findings will be valuable to the academicians, who may find useful research gaps that may stimulate interest in further research in future. Recommendations will be made on possible areas of future studies.

To Investors

This study is further justified since it will be of value to those interested in setting up manufacturing firms in the country since they will be able to understand what to do right to succeed and what if done wrong would bring the business down.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews literature relating to working capital management and firm performance. The literature review has been organized in the following sections. First section covers the concept of working capital management, its definition and various perspectives taken on the subject matter by various scholars and the theoretical framework underpinning the subject area. The second section covers the cash conversion cycle while the performance measures are explained in the section after with the empirical reviews on the subject matter being covered in the last section.

2.2 Defining Working Capital Management

Working capital management (WCM), which deals with the management of current assets and current liabilities, is very important, in corporate finance because it directly affects the liquidity and profitability of the firm (Appuhami, 2008). According to Eljelly, (2004), the current assets of a typical manufacturing firm or even a distribution firm account for more than half of the firm's total assets. Deloof (2003) held the same proposition that the accounts receivables and inventories comprise a substantial percentage of the total assets of a firm. Excessive levels of current assets can easily result in a firm's realizing a substandard return on investment. However, firms with too few current assets may incur shortages and difficulties in maintaining smooth operations (Van Home and Wachowicz, 2005). The main objective of the working capital

management is to ascertain that a firm has the ability to continue operating with sufficient cash flow for payment of both maturing short-term debt and impending operational expenses.

Efficient 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 at the same time to avoid excessive investment in these assets on the other hand (Eljelly, 2004). Managers spend considerable time on day-to-day problems that involve working capital decisions (Raheman and Nasr, 2007). One reason for this is that current assets are short-lived investments that are continually being converted into other asset types (Rao, 1989). With regard to current liabilities, the firm is responsible for paying these obligations on a timely basis. Taken together, decisions on the level of different working capital components become frequent, repetitive and time consuming (Appuhami, 2008).

The way in which working capital is managed can have a significant impact on both the liquidity and profitability of the firm (Deloof, 2003). For example, decisions that tend to maximize profitability tend to minimize the chances of adequate liquidity. Conversely, focusing almost entirely on liquidity will tend to reduce the potential profitability of the firm. A firm can have larger sales with a generous credit policy which extends the cash cycle. In this case, the longer cash conversion cycle may result in higher profitability. However, the traditional view of the relationship between the cash conversion cycle and corporate profitability is that, *ceteris paribus*, a longer cash conversion cycle hurts the profitability a firm (Deloof, 2003).

The management of working capital is a very sensitive area in the field of financial management. It involves the decision on the amount and composition of current assets and the financing of these assets. Current assets include all those assets that in the normal course of business return to

the form of cash within a short period of time, ordinarily within a year and such temporary investment as may be readily converted into cash upon need (Raheman and Nasr, 2007). Smith (2000) and Raheman and Nasr (2007) observed that working capital management is important because of its effects on the firm's profitability and risk and consequently its value.

According to Afza and Nazir (2007), firms try to keep an optimal level of working capital that maximizes their value and the efficient management of working capital is likely to yield significant results and its neglect can be highly dangerous to any firm (Christopher and Kamalavalli, 2009). Eljelly (2004) described that the efficient WCM are engaged with planning and controlling current assets and liabilities in such a way that eliminates the risk of inability to meet short-term obligations in hands with the avoidance of excessive investments in these assets. Siddiquee and Khan (2009) indicate that the inefficient management of WC not only reduces profitability but ultimately may also lead a concern to financial crisis thus every organization, irrespective of its profit orientation, size and nature of business, needs requisite amount of WC. Consequently, the efficient WCM is the most crucial factor in maintaining survival, liquidity, solvency and profitability of the concerned business organization.

Corporate liquidity is examined from two distinct dimensions: static or dynamic views (Farris and Hutchison, 2002; and Moss and Stine, 1993). The static view is based on commonly used traditional ratios, such as current ratio and quick ratio, calculated from the balance sheet amounts. These ratios measure liquidity at a given point in time whereas dynamic view measures ongoing liquidity from the firm's operations. As a dynamic measure of the time it takes a firm to go from cash outflow to cash inflow which is measured by cash conversion cycle.

2.3 Theories of Working Capital Management

Firms usually come to the conclusion that there is a need for an appropriate mixture of debt finance with regard to the length of time to maturity; some short term borrowing is desirable alongside some long-term borrowing (Brigham and Ehrhardt, 2004). This is because there is always a minimum level of current assets which is continuously required by a firm to carry on its business operations. This forms the permanent or fixed working capital. The extra working capital needed to support the changing production and sales activities is the variable or temporary working capital. Both are necessary to facilitate production and sales through the operating cycle. The major factors to be considered in achieving the right balance between the permanent and variable working capital include cost (interest rate, arrangement fee etc) and risk (of not being able to renew borrowings, of the yield curve shifting or not being able to meet sudden outflow if the maturity is bunched, etc) (Weinraub and Visscher, 1998).

2.3.1 Matching Approach

According to Gitman (2005), some firms follow the matching principle, in which the maturity structure of finance matches the maturity period of the project or asset. Here, the fixed assets and current assets which are needed on permanent basis are financed through long term sources, while current assets whose financing needs vary throughout the year are financed by short term borrowings. A firm that is taking the maturity approach is considered to be adopting a moderate stance. Under such an approach, a rising level of total assets is financed principally through increases in long-term finance applied to fixed assets and permanent current assets. The fluctuating current assets such as those related to seasonal variations are financed with short-term funds (Gitman, 2005).

2.3.2 Aggressive Approach

This approach considered more risk because of the frequent need to refinance to support permanent current assets as well as fluctuating current assets. Moyer et al., (2005) observe that if a firm relied on overdraft for this, it will be vulnerable to a rapid withdrawal of that facility and if stocks and cash are reduced to pay back the overdraft the firm may experience severe disruptions, loss of sales and output, and additional costs because of a failure to maintain the minimum required working capital to sustain optimum profitability. Thus, Bringham and Ehrhardt (2004) posit that this working capital policy will be associated with higher return and risk.

According to Smith (1980), a firm may adopt an aggressive working capital management policy with a low level of current assets as a percentage of total assets, or it may also be used for the financing decisions of the firm in the form of high level of current liabilities as a percentage of total liabilities. Working capital management is important because of its effects on the firms' profitability and risk, and consequently its value (Smith, 1980). The greater the investment in current assets, the lower the risk, but also the lower the profitability obtained. However, contrary to this, Carpenter and Johnson (1983) provided empirical evidence that there is no linear relationship between the level of current assets and revenue systematic risk of the US firms; however, some indications of a possible nonlinear relationship were found, which were not highly statistically significant.

2.3.3 Conservative Approach

Under the conservative approach, the firm finances its permanent assets and also a part of temporary current assets with long term financing. When there are times in the course of the year when surplus cash is available, this will be invested in short-term instruments. Many managers feel much happier under the conservative approach because of the lower risk of being unable to pay bills as they arise. The low-risk is to make sure that long term financing covers the total investment of the assets. However, such a policy may not be to the best interest of the owners of the firm. The short term funds invested in the short term securities is unlikely to earn satisfactory return relative to the cost of the long term funds. In all likelihood, shareholders would be better off if the firm reduced its long term financing, by returning cash to shareholders or paying off some long term loans.

Van Horne and Wachowicz (2004) further observe that excessive levels of current assets as advocated by the conservative working capital may have a negative effect on the firm's profitability, whereas a low level of current assets may lead to a lower level of liquidity and stock-outs, resulting in difficulties in maintaining smooth operations. More aggressive working capital policies are associated with higher return and risk, while conservative working capital policies are associated with lower risk and return (Weinraub and Visscher, 1998).

2.4 Effect of Working Capital on Profitability

The way in which working capital is managed can have a significant impact on both the liquidity and profitability of the firm (Deloof, 2003). Decisions that tend to maximize profitability tend to minimize the chances of adequate liquidity while at the same time, focusing almost entirely on liquidity will tend to reduce the potential profitability of the firm. A firm can have larger sales

with a generous credit policy. However, the traditional view of the relationship between the cash conversion cycle and corporate profitability is that, *ceteris paribus*, a longer cash conversion cycle hurts the profitability a firm (Deloof, 2003, Smith, 1980).

A useful way of assessing the liquidity of firms is with the cash conversion cycle (CCC) (Moss & Stine, 1993). It measures the time lag between cash payments for purchase of inventories and collection of receivables from customers. Traditionally, measures of liquidity have been the current ratio and quick ratio and have been useful indicators of firm's liquidity. However, according to Moss and Stine (1993) they focus on static balance sheet values. On the other hand, the CCC is a dynamic measure of ongoing liquidity management, since it combines both balance sheet and income statement data to create a measure with a time dimension (Jose *et al.*, 1996).

While the analysis of an individual firm's CCC is helpful, industry benchmarks are crucial for a company to evaluate its CCC performance and assess opportunities for improvement (Hutchison *et al.*, 2007) because, the length of CCC may differ from industry to industry. Therefore, the correct way is to compare a specific firm to the industry in which it operates.

The Cash Conversion Cycle (CCC) is used as a comprehensive measure of working capital as it shows the time lag between expenditure for the purchases of raw materials and the collection of sales of finished goods (Padachi, 2006). Day-to-day management of a firm's short term assets and liabilities plays an important role in the success of the firm. Firms with growing long term prospects and healthy bottom lines do not remain solvent without good liquidity management (Jose *et al.*, 1996).

According to Bodie and Merton (2000) the Cash Cycle Time represents the number of days between the date the firm must start to pay cash to its suppliers and the date it begins to receive cash from its customers. On the other hand Keown *et al.* (2003), defined the Cash Conversion Cycle as the sum of days of sales outstanding (average collection period) and days of sales in inventory less days of payables outstanding. On his part, Jordan (2003) considers the Cash Cycle as the number of days that pass before we collect the cash from sale, measured from when we actually pay for the inventory.

Keown *et al.* (2003) express cash conversion cycle with the following equation similar to many researchers as follows:

$$\text{Cash Conversion Cycle} = \text{Days of Sales Outstanding} + \text{Days of Sales in Inventory} - \text{Days of Payables Outstanding}$$

In the formula above, the three variables to which CCC is dependent are defined as follows

$$\text{Days of Sales Outstanding} = \frac{\text{Accounts receivables}}{\text{Sales}} \times 365$$

$$\text{Days of Sales in Inventory} = \frac{\text{Inventories}}{\text{Cost of goods sold}} \times 365$$

$$\text{Days of Payables Outstanding} = \frac{\text{Accounts payables}}{\text{Cost of goods sold}} \times 365$$

The day's sales outstanding (DSO) is the time taken to collect cash from customers. The average collection period is used as a proxy for the collection policy as an independent variable (Garcia-Teruel & Martinez-Solano, 2007). The days of sales in inventory (DSI) refers to the time taken to convert inventory held in the firm into sales. This view is consistent with studies undertaken such as by Deloof, (2003). In these studies, the inventory conversion period was used as a proxy for the inventory policy. On the other hand, the days of payables outstanding is the time taken to pay the firms suppliers.

Cash conversion cycle is likely to be negative as well as positive. A positive result indicates the number of days a company must borrow or tie up capital while awaiting payment from a customer. A negative result indicates the number of days a company has received cash from sales before it must pay its suppliers (Hutchison *et al.*, 2007). The ultimate goal is having low CCC, if possible negative. Because the shorter the CCC, the more efficient the company in managing its cash flow.

According to Bodie and Merton (2000), a firm can reduce its need for working capital by among others reducing the amount of time that goods are held in inventory. This can be accomplished by improving the inventory control process or by having suppliers deliver raw materials exactly when they are needed in the production process. In addition, a firm should collect accounts receivable more quickly. Among the methods available to speed up the collection process include improving the efficiency of the collection process, offering discounts to customers who pay faster, and charging interest on accounts that are overdue.

Firms may have an optimal level of working capital that maximizes their value. Large inventory and a generous trade credit policy may lead to high sales. Larger inventory reduces the risk of a stock-out. Trade credit may stimulate sales because it allows customers to assess product quality before paying (Deloof & Jegers, 1996). Another component of working capital is accounts payable. Delaying payments to suppliers allows a firm to assess the quality of bought products, and can be an inexpensive and flexible source of financing for the firm. On the other hand, late payment of invoices can be very costly if the firm is offered a discount for early payment. A longer cash conversion cycle might increase profitability because it leads to higher sales. However, corporate profitability might also decrease with the cash conversion cycle, if the costs of higher investment in working capital rise faster than the benefits of holding more inventories and/or granting more trade credit to customers.

2.5 Performance Measures

Traditional methods of measuring a company's performance by financial indices alone have virtually disappeared from large organizations (Basu, 2001). Non-financial measures are at the heart of describing strategy and of developing a unique set of performance measures that clearly communicate strategy and help in its execution (Kaplan & Norton, 1992, 1996). Frigo (2002) reported the existence of a gap between strategy and performance measures, which failed to support the communication of strategy within an organization. Hudson *et al.* (2001) concluded that although there was a widespread acceptance of the value of strategic performance measurement amongst firms that they studied, none had taken steps to redesign or update their current performance measurement systems.

2.5.1 Financial Measures

Financial measures as a form of business performance measurement still remains an important part of running a growing business, especially in the current economic climate. Most growing businesses ultimately target increased profits, so it is important to know how to measure profitability. The key standard measures are:-

Liquidity measures the ability of the firm business to meet financial obligations as they become due, without disrupting the normal, ongoing operations of the business. Liquidity can be analyzed both structurally and operationally. Structural liquidity refers to the balance sheet (assets and liabilities) and operational liquidity refers to cash flow measures (Du Rietz & Henrekson, 2000).

Two recommended measures of liquidity are the current ratio and working capital. The current ratio measures the relationship between total current firm assets and total current firm liabilities and is a relative measure rather than an absolute dollar measure. The higher the ratio, the more liquid the firm is considered to be. Working capital is a measure of the amount of funds available to purchase inputs and inventory items after the sale of current firm assets and payment of all current firm liabilities. Working capital is expressed in absolute dollars; therefore, determining adequate working capital is related to the size of the firm operation (Du Rietz & Henrekson, 2000).

Solvency measures the amount of borrowed capital used by the business relative to the amount of owner's equity capital invested in the business. In other words, solvency measures provide an indication of the business' ability to repay all indebtedness if all of the assets were sold. Solvency measures also provide an indication of the business' ability to withstand risks by

providing information about the firm's ability to continue operating after a major financial adversity (Hammes, 2003).

Unlike liquidity, solvency is concerned with long-term as well as short-term assets and liabilities. Solvency measures evaluate what would happen if all assets were sold and converted into cash and all liabilities were paid. The most straightforward measure of solvency is owners equity, using the market value of assets and including deferred taxes in the liabilities. As with working capital, adequacy of equity depends on business size, making comparisons difficult without using ratios (Hammes, 2003).

Three widely used financial ratios to measure solvency are the debt-to-asset ratio, the equity-to-asset ratio and the debt-to-equity ratio. These three solvency ratios provide equivalent information, so the best choice is strictly a matter of personal preference. The debt-to-asset ratio expresses total firm liabilities as a proportion of total firm assets and the higher the ratio, the greater the risk exposure of the firm. The equity-to-asset ratio expresses the proportion of total assets financed by the owner's equity. The debt-to-equity ratio reflects the capital structure of the firm and the extent to which firm debt capital is being combined with firm equity capital. It is a measure of the degree to which a firm is leveraging its equity.

Profitability measures the extent to which a business generates a profit from the factors of production: labor, management and capital. Profitability is the most important measure of success of the business. A business that is not profitable cannot survive, yet a highly profitable one has the ability to reward its owners with a large return on their investment. Profitability analysis focuses on the relationship between revenues and expenses and on the level of profits relative to the size of investment in the business (Mesquita & Lara, (2003).

Four useful measures of firm profitability are the rate of return on firm assets (ROA), the rate of return on firm equity (ROE), operating profit margin and net firm income. The ROA measures the return to all firm assets and is often used as an overall index of profitability, and the higher the value, the more profitable the firm business. The ROE measures the rate of return on the owner's equity employed in the firm business. It is useful to consider the ROE in relation to ROA to determine if the firm is making a profitable return on their borrowed money (Hadlock & James, 2002).

The **operating profit margin** measures the returns to capital per dollar of gross firm revenue. The two ways a firm has of increasing profits is by increasing the profit per unit produced or by increasing the volume of production while maintaining the per unit profit. The operating profit margin focuses on the per unit produced component of earning profit and the asset turnover ratio (discussed below) focuses on the volume of production component of earning a profit (Mesquita & Lara, 2003).

Net firm income comes directly off the income statement and is calculated by matching firm revenues with the expenses incurred to create those revenues, plus the gain or loss on the sale of firm capital assets. Net firm income represents the return to the owner for unpaid operator and family labor, management and owner's equity. Like working capital, net firm income is an absolute dollar amount and not a ratio, thus comparisons to other firms is difficult because of firm size differences (Deloof & Jegers, 1996).

Repayment capacity measures the ability to repay debt from both firm and non-firm income. It evaluates the capacity of the business to service additional debt or to invest in additional capital

after meeting all other cash commitments. Measures of repayment capacity are developed around an accrual net income figure (Mesquita & Lara, 2003).

The short-term ability to generate a positive cash flow margin does not guarantee long-term survivability. Long-term survivability requires the firm to be profitable. The only way for an unprofitable firm to survive long-term is for income infusions from non-firm sources to offset firm losses. These cash infusions usually come from off-firm employment, inheritances and gifts or from a lender if the firm assets appreciate faster than the firm is losing money and the owner can successfully refinance the firm's debts (Andersson & Reeb, 2003).

Palepu, Healy, and Bernard (2000) asserted that "the starting point for a systematic analysis of a firm's performance is its return on equity (ROE)." Return on assets (ROA) is an important determinant of ROE because it shows how much profit a company is able to generate for each dollar of assets invested (Palepu et al., 2000). Although ROE and ROA are commonly used to assess the performance of large companies, research into SMEs performance has tended to focus on sales or profit, or growth in sales or profit (Fasci and Valdez, 1998). While there is no doubting the importance of sales and profit to a business, it is equally important to relate these output measures to measures of inputs (namely assets or equity) when making comparisons of business performance.

2.5.2 Non-Financial Measures

Financial measures do not convey the full picture of a company's performance, especially in today's competitive environment where companies are competing in terms of product, quality, delivery, reliability, after-sales service and customer satisfaction. None of these services is measured by the traditional responsibility accounting system, despite the fact that they represent

the major goals of world-class manufacturing companies. Many companies are using both qualitative and quantitative non-financial indicators such as; quality, lead time, number of customer complaints and warranty claims, delivery time, non-product hours, and system down time. Unlike traditional variance reports, measures such as these can be provided quickly for managers, per shift, daily or even hourly. They are easy to calculate and also easier for non-financial managers to understand (Bozec, 2005).

Performance measurement systems play a key role in developing strategy, evaluating the achievement of organizational objectives and compensating managers. Managers believe there was too much emphasis on financial measures such as earnings and accounting returns and little emphasis on drivers of value such as customer and employee satisfaction, innovation and quality. This has led into innovations ranging from non-financial indicators of “intangible assets” and intellectual capital” to “balanced scorecards” of integrated financial and non-financial measures. Although non-financial measures have become increasingly important in decision-making and performance evaluation, the choice of measures to be adopted must be linked to factors such as corporate strategy, value drivers, organizational objectives and the competitive environment. In addition, companies should remember that performance measurement choice is a dynamic process - measures may be appropriate today, but the system needs to be continually reassessed as strategies and competitive environments evolve (King & Santor, 2008).

Although non-financial measures are increasingly important in decision-making and performance evaluation, companies should not simply copy measures used by others. The choice of measures must be linked to factors such as corporate strategy, value drivers, organizational objectives and the competitive environment. In addition, companies should remember that performance measurement choice is a dynamic process - measures may be appropriate today, but

the system needs to be continually reassessed as strategies and competitive environments evolve (Sharma *et. al.*, 2005).

2.6 Empirical Review

The importance of WCM is not new to the finance literature and the review of prior literature reveals that there exists a significant relation between performance and working capital management by using different variable selection for analysis. Ganesan, (2007) analyze the working capital management efficiency of firms from telecommunication equipment industry. The variables used to represent the working capital are day's sales outstanding, days inventory outstanding, days payable outstanding, days working capital, and current ratio while profitability and liquidity are represented by cash conversion efficiency, income to total assets and income to sales. This study found evidence that even though "day's working capital" is negatively related to the profitability, it is not significantly impacting the profitability of firms in telecommunication equipment industry. However, this was contrary to the results of Chowdhury and Amin (2007) who had found positive correlations between WCM with financial performance of the Pharmaceutical industry in Bangladesh.

Narware (2004) in his empirical study on Indian National Fertilizer Limited, for 1990-91 to 1999-2000 signify that working capital management and profitability of the company disclosed both negative and positive association. He also found evidence that increase in the profitability of a company was less than the proportion to decrease in working capital. However, the study done by Raheman and Nasr, (2007) on a sample of 94 Pakistani firms listed on Karachi Stock Exchange for a period of 6 years from 1999 – 2004, demonstrate a strong negative relationship

exists between variables of the working capital management represented by liquidity and debt with profitability of the firm.

Whilst, Afza and Nazir (2007) through cross-sectional regression models on working capital policies, profitability and risk of the firms, found a negative relationship between the profitability measures of firms and degree of aggressiveness on working capital investment and financing policies, their result indicates that the firms yield negative returns if they follow an aggressive working capital policy by investigating the relative relationship between the aggressive or conservative working capital policies for 208 public limited companies listed at Karachi Stock Exchange for a period of 1998-2005.

According to Padachi (2006), high investment in inventories and receivables is associated with lower profitability. He used return on total assets as a measure of profitability for a sample of 58 small manufacturing firms in Mauritius for the period 1998 –2003. His findings reveal an increasing trend in the short-term component of working capital financing. Similar to most recent study by Christopher and Kamalavalli, (2009), which focus on 14 corporate hospitals in India for the period 1996-97 to 2005-06. Their correlations and regression analysis signifying that working capital component namely current ratio, cash turnover ratio, current assets to operating income and leverage negatively influence profitability.

The cash conversion cycle had been widely used as a major component representing working capital. One of the earlier studies done by Jose, Lancaster and Stevens(1996) for the twenty-year period from 1974 through 1993 of 2,718 firms offers strong evidence that aggressive working-

capital policies indicated by shorter cash conversion cycle enhance profitability. Their findings are similar to Lazaridis and Tryfonidis (2006) that showed there is a statistical significance between profitability, measured through gross operating profit, and the cash conversion cycle using the sample of 131 companies listed in the Athens Stock Exchange (ASE) for the period of 2001-2004. In addition, a relatively recent study by Uyar (2009) also found a significant negative correlation between the CCC with profitability measured by return on asset but not significant with return on equity. By utilizing ANOVA and Pearson correlation analyses of the corporations listed in the Istanbul Stock Exchange (ISE) for the year 2007, he indicates that the firms with shorter CCC are more likely to be more profitable than the firms with longer CCC.

A study by Kieschnick, LaPlante and Moussawi (2008) using data on a panel of U.S. corporations from 1990 through 2004, established the importance of working capital management to firm value. Their study used stock's excess return to represent the firm value and findings show that on average an additional dollar invested in net operating working capital reduces firm value and this indicates that their study is consistent with industry surveys suggesting that some firms over-invest in net operating working capital.

On his part, Nazir (2009) analyzed the impact of aggressiveness of working capital investment and financing policies in Pakistan for a sample of 204 non-financial firms listed at Karachi Stock Exchange for the period of 1998-2005. They evaluated on firm returns i.e. return on assets and Tobin's Q to represent market performance and indicates that firms adopting an aggressive approach towards working capital financing policy give more value to the firms while inverse relationship between the aggressiveness of working capital investment policies on firms

performance exist. These results are consistent with Afza and Nazir (2007) that using Tobin's Q to represent stock market performance of Karachi Stock Exchange. According to Irene and Lee (2007) who researched on the prevailing working capital management practices of some well-performed Malaysian public firms listed on Bursa Malaysia, they examined the correlation between profitability and the level of working capital of the sample firms and found out that profitability and working capital are linearly related positively to a certain extent.

Schilling (1996) mentions optimum liquidity position, which is minimum level of liquidity necessary to support a given level of business activity, in his writing. He says it is critical to deploy resources between working capital and capital investment, because the return on investment is usually less than the return on capital investment. Therefore, deploying resources on working capital as much as to maintain optimum liquidity position is necessary. Then he sets up the relationship between CCC and minimum liquidity required such that if the CCC lengthens, the minimum liquidity required increases; conversely, that if the CCC shortens, the minimum liquidity required decreases.

2.7 Conclusion

The importance of the management of working capital in a firm has been expounded in detail both in the literature as well as from the empirical studies done on the subject area. A firm's working capital was found to affect a firm's liquidity and profitability and thus the objective of managing working capital is to ascertain that a firm has the ability to continue operating with sufficient cash flow for payment of both maturing short-term debt and impending operational expenses. Efficient 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 at the same time to avoid excessive investment in these assets on the other hand.

A review of prior literature reveals that there exists a significant relation between performance and working capital management by using different variable selection for analysis. In addition, it has been found out that different sector companies have different levels of working capital and they will always strive to maintain the level of working capital in the short term. The risk behaviour preference of the firms' management was also found to have an effect in the level of current assets and current liabilities that is held by a firm. For risk averse managers, it was found out that such firms will hold a high proportion of current assets compared to the current liabilities and vice versa for risk seeking managers. In effect therefore, the level of risk preference characteristics of firm's managers will affect the level of performance and profitability of the organization.

However, it is evident from the literature that none of the studies has been able enough to develop a model that will assist managers to establish an optimum working capital under different operating environments or even industries. Instead the literature and studies suggest the existence of an optimum level without necessarily suggesting the same level or how to be establishing it.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter sets to explain the research design, the population of interest, the basis of sample selection, the type of secondary data used, the sources of data, the techniques of analysis used and the data analysis. A multivariate model is estimated using the SPSS.

3.2 Research Design

The research design adopted was cross-sectional study in which data was gathered just once over the period 2006 to 2010. As such, the causal study was undertaken in a non-contrived setting with no researcher interference. The unit of analysis was the individual manufacturing firms listed at the NSE and the purpose of the study was to establish a relationship between Working Capital Management and profitability of these firms.

This study was carried out through the use of secondary data as detailed in the listed companies' annual reports. Through the use of the listed Manufacturing firms in the NSE, the researcher obtained the data for various variables included in the study from the financial statements in the annual report of the listed companies. This data was then analyzed through the use of regression and correlation analysis to determine the effect and direction of the various factors identified on the level of working capital held by the firms on the performance.

3.3 Population of the Study

The population of interest in this study was composed of all publicly quoted manufacturing firms at the Nairobi Stock Exchange between 2006 and 2010. Unlisted firms were excluded as their annual reports were not easily available. Currently, there are 17 listed firms at the NSE in the Main Investment Market Segment (MIMS) that constituted the requisite population (Appendix I). The reason as to why these markets were chosen is primarily due to the availability and the reliability of the financial statements in that they are subject to the mandatory audit by internationally recognized audit firms. Furthermore, firms listed on the stock exchange market have an incentive to present profits if those exist, in order to make their shares more attractive (Lazaridis & Tryfonidis, 2006) and also from the fact that the number of firms in this market had not changed over the study period.

3.4 Sample and Sampling Procedure

In order to obtain a representative sample from the population, a number of filters were applied. Observations of firms with anomalies such as negative values in their total assets, current assets, fixed assets, capital, depreciation or the interest paid were eliminated. In addition, only firms that had continuously traded over the period 2006 to 2010 were considered in the study. Further, observations of items from the balance sheet, and profit and loss accounts showing signs contrary to reasonable expectations were removed. Subject to the foregoing, it was intended that the study was a census survey in which all manufacturing firms listed at the NSE were to be studied, due to the manageable numbers involved.

3.5 Data Collection

Data was collected from annual reports submitted to the NSE and Capital Markets Authority. Annual reports of the firms were obtained between 2006 and 2010 which was the study period. The company's annual accounts were obtained from the NSE library and the Capital Markets Authority. All companies in the sector that were continually listed between 2006 and 2010 were included to ensure that the sampling frame was current and complete.

3.6 Variables and Variable Measurement

Regression analysis was used to analyze the data that was collected. On the basis of the sample data, the researcher estimated the value of the variable Y corresponding to a given value of variable X. The study followed Deloof (2003) in establishing the dependent variable (Y) represented by the Net Operating Profit (NOP) ratio which was obtained through $(\text{Sales} - \text{Cost of Sales} + \text{Depreciation and Amortization}) / (\text{Total assets} - \text{Financial assets})$. The NOP was then related with the following independent proxies for the hypothesized determination of working capital.

3.6.1 Average Collection Period (ACP)

This represents the time taken to collect cash from customers. The average collection period was used as a proxy for the collection policy as an independent variable. ACP, the accounts collection period is obtained thus:

$$\text{ACP} = \text{accounts receivables/sales} \times 365.$$

3.6.2 Inventory Holding Period (IHP)

This variable refers to the time taken to convert inventory held in the firm into sales. The inventory conversion period was used as a proxy for the inventory policy consistent with

Lazaridis and Tryfonidis (2006). Consistent with previous studies such as Deloof, (2003) inventory conversion period is determined by:

$$\text{IHP} = \text{inventory}/\text{cost of sales} \times 365.$$

3.6.3 Average Payment Period (APP)

This was the time taken to pay the firm's suppliers. Raheman and Nasr (2007) used the same variable and in this research, the average payment period was used as a proxy for the firm's payment policy.

$$\text{APP} = \text{Accounts Payable}/ \text{Purchases} \times 365$$

3.6.4 Cash Conversion Cycle (CCC)

The cash conversion cycle, CCC is obtained by adding the ACP to IHP and then subtracting the APP.

$$\text{CCC} = \text{ACP} + \text{IHP} - \text{APP}$$

This variable was aimed at expressing the three working capital components together against the NOP.

3.6.5 Leverage Ratio (LEV)

This was obtained by (Short term debt + long-term debt) / Fixed assets. This variable was added to the regression model to act as a control variable to the firms' characteristic.

3.6.6 Age of the Firm (AGE)

The age of the firm was obtained by determining the natural logarithm of the number of years the firm will have been in existence since its inception.

A multivariate regression model was used to analyze the relationship between the working capital management level of the firm and the performance of the firm and the working capital factors influencing performance as follows;

$$NOP = f(ACP, IHP, APP, CCC, LEV, AGE, \alpha)$$

The equation will specifically take the form;

$$NOP = \beta_0 + \beta_1ACP + \beta_2IHP + \beta_3APP + \beta_4CCC + \beta_5LEV + \beta_6AGE + \alpha$$

Where NOP is the performance factor of the firm, ACP, IHP, APP, CCC, LEV, and AGE are the factors influencing performance of a firm as explained above. β_0 , β_1 , β_2 , β_3 , β_4 , β_5 and β_6 are constants representing the direction and the extent to which each variable influences performance of a firm. α is the error term that is a surrogate for all other variables influencing performance.

To complement the regression analysis, correlation analysis carried out to find the direction of the relationship between WCM and performance, as well as the magnitude. The Statistical Package for Social Sciences (SPSS) was used to analyse the data.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the results and findings of the study based on the research objectives. The results are presented in the form of summary tables. Regression and Correlation analysis are used to analyse the data to answer the research objective.

4.2 Results

The regression analysis was conducted using the measures of working capital and control variables. Test of significance was carried out for all variables studied using t-test at the 95% level of significance. From the observation, any p-value that is greater than 0.05 was deemed to have a significant relationship with the dependent variable, else the relationship was considered insignificant. The standardized coefficient and the t-statistic indicate the strength of the relationship between the dependent and the independent variables. The adjusted R-square measures the degree of variability of the dependent variable due to the change in the independent variable. The results are as indicated below in sections 4.3 and 4.4 while the source data is presented in a tabular format in appendix 2.

4.3 Descriptive Analysis

The descriptive analysis below shows the average and standard deviation of the different variables of interest in the study. It also presents the percentile values of the variables which help in getting a picture about the maximum and minimum values a variable can achieve.

In Table 1 below, the summary statistics of the variables included in the regression models are presented. It represents the variables of the 14 manufacturing firms listed at the NSE for the period 2006-2010.

Table 1: Summary statistics

		NOP	ACP	IHP	APP	CCC	LEV	AGE
N	Valid	70	70	70	70	70	70	70
	Missing	0	0	0	0	0	0	0
Mean		.647458	37.718983	92.216949	48.760847	83.988475	1.476271	1.621917
Median		.400000	31.200000	92.800000	42.000000	79.400000	.900000	1.623249
Std. Deviation		.4219122	34.0136233	45.0706731	37.0223301	52.1237788	2.4281637	.2523153
Percentiles	25	.300000	9.600000	57.400000	25.000000	42.300000	.600000	1.544068
	50	.400000	31.200000	92.800000	42.000000	79.400000	.900000	1.623249
	75	.600000	59.300000	126.500000	60.100000	124.400000	1.500000	1.748188

Source: Calculations based on Annual reports of firms from 2006-2010

The mean value of the net operating profit is 64.7% of the total assets and the standard deviation 42.2%. It means that value of the profitability can deviate from the mean to both sides by 42.2%. Firms receive payment against sales after an average of 38 days and standard deviation is 34 days, with the first quartile (third quartile) of 9.5 days [59.3 days (approximately two months)]. On average, firms take 92.2 (median 92.8) days (approximately three months) to convert their inventories into sales, with the first quartile (third quartile) of 57.4 days (approximately two months) [126.5 days (approximately four months)]. An average firm takes 48.8 (median 42.0) days (approximately one and half months) to pay its creditors, with the first quartile (third quartile) of 25 days (approximately one month) (60.1 days (approximately two months)).

The cash conversion cycle used as a proxy to check the efficiency in managing working capital is on average 84 days and standard deviation is 51.2 days. The mean (median) leverage ratio is 147% (90%) lagged by total assets. On the other hand, the average (median) age of a firm in the sample was 1.62 (1.623) as measured by the natural logarithm of the number of years since the firm was founded. All variables share a common sample size of 70 firm-years.

4.4 Quantitative Analysis

For quantitative analysis the study used two methods. At first, correlation is used to measure the degree of association between different variables under consideration. As multiple variables are influencing the problem, the study identified the crucial factors associated with working capital management. Pearson and Spearman correlations are calculated for all variables used in the study starting with the Pearson's correlation results. Secondly, regression analysis is similarly used.

4.4.1 Pearson and Spearman's Correlations

Table 2 below shows the Pearson and Spearman's correlation coefficient generated from the data. Consistent with Shin and Soenen (1998), the spearman's rank correlation coefficients are on the upper right triangle while the Pearson product moment correlation coefficients are on the lower left triangle. Pearson's Correlation analysis is used for data to see the relationship between variables such as those between working capital management and profitability. If efficient working capital management increases profitability, one should expect a negative relationship between the measures of working capital management and profitability variable. There is a negative relationship between gross profitability on the one hand and the measures of working capital management on the other hand. This is consistent with the view that the time lag between

expenditure for purchases of raw material and the collection of sales of finished goods can be too long, and that decreasing this time lag increases profitability.

Table 2: Pearson and Spearman's Correlation Coefficient

		NOP	ACP	IHP	APP	CCC	LEV	AGE
NOP	Pearson Correlation	1	-.264	-.198	.386	-.102	.259	.296
	Sig. (2-tailed)		.043	.133	.003	.444	.047	.023
ACP	Pearson Correlation	-.264	1	.517	.633	.604	-.042	.142
	Sig. (2-tailed)	.043		.000	.000	.000	.754	.284
IHP	Pearson Correlation	-.198	.517	1	.431	.832	-.094	.270
	Sig. (2-tailed)	.133	.000		.001	.000	.479	.039
APP	Pearson Correlation	.386	.633	.431	1	.139	-.169	.112
	Sig. (2-tailed)	.003	.000	.001		.293	.200	.399
CCC	Pearson Correlation	-.102	.604	.832	.139	1	-.062	.091
	Sig. (2-tailed)	.444	.000	.000	.293		.638	.494
LEV	Pearson Correlation	.259	-.042	-.094	-.169	-.062	1	.205
	Sig. (2-tailed)	.047	.754	.479	.200	.638		.119
AGE	Pearson Correlation	.296	.142	.270	.112	.091	.205	1
	Sig. (2-tailed)	.023	.284	.039	.399	.494	.119	

Source: 2006 -2010 survey data, researchers' computation

The results show that there is a negative relationship between the NOP and the ACP, IHP and CCC. The table also shows that NOP is positively related to APP, LEV and the firms AGE. The positive relation between NOP and APP can be explained by the fact that lagging payments to suppliers ensures that the firm has some cash to purchase more inventory for sale thus increasing its sales levels hence boosting its profits. On the other hand the negative relationship between

NOP and CCC is consistent with the view that the time lag between the expenditure for the purchases of raw materials and the collection of sales of finished goods can be too long and that decreasing this time lag increases profitability (Deloof, 2003). The Firm size is positively related to NOP. This means that larger firm report higher profits compared to smaller firms. This may be due to larger firm's ability to exploit their economies of scale.

Relationship between Average Collection Period (ACP), Inventory Holding Period, Cash Conversion Cycle and Net Operating Profit (NOP)

A negative relationship exists between the ACP and profitability ($p < 0.05$). This result means that firms can improve their profitability by reducing the number of days accounts receivable are outstanding. Thus it implies that as customers take less time to pay their debts, the more cash is available to firms, which enables them to replenish inventory and therefore the higher the sales realized leading to higher profitability of the firm. This result therefore implies that managers can improve their firms' profitability by reducing the credit period granted to their customers. A more stringent credit policy adopted by a firm will generate early payment by the customers and therefore improve performance. The result of correlation analysis shows a negative coefficient – 0.264, with p -value of (0.043). It indicates that the result is highly significant at $\alpha = 5\%$ and that if the average collection period increases it will have a negative impact on the profitability. This finding of the manufacturing firms will be in tandem with that of Lazaridis and Tryfonidis (2006) as well as that of Mathuva (2010).

The coefficient on the inventory holding period is negative and significant at 5%. This means that there exists a negative relationship between the IHP and profitability. This finding suggests that if a firm carries out an aggressive working capital policy by holding minimal stock then the firm profit will be maximised. This means that maintaining high inventory levels and thus having

high inventory holding period increases both the holding and ordering cost of the stock and therefore leading to the decrease of the firm's profits. The result of correlation analysis shows a negative coefficient -0.198 , with p -value of (0.133) . It indicates that the result is significant at $\alpha = 5\%$ and that if the inventory holding period increases it will have a negative impact on the profitability.

The cash conversion cycle in the study is used as a proxy to check the efficiency in managing working capital. The Pearson coefficient is -0.102 with a p -value of 0.444 . This relationship is consistent with what is expected in the relationship between the cash conversion cycle and profitability of the firm. With a small CCC, then it implies that the firm takes a small time period between the purchasing goods on credit from suppliers, holding them in the warehouse, selling the same on credit and eventually receiving the cash from the customers. This decrease in the cash conversion cycle enables the firm to generate and have adequate cash flows for financing both operations and financing strategy of the firm and therefore resulting in the increase in profitability.

The firm size is positively related to profitability and this is significant at 5% . This means that larger firm report higher profits compared to smaller firms and all other factors remaining constant, the size of the firm is directly related to age of the organization. This may be due to larger firm's ability to exploit their economies of scale. The use of leverage is positively related implying that a firm is able to generate more through borrowing if the cost of borrowing is lower than the opportunity cost of using internal financing or sourcing additional equity capital. The lower cost of borrowing is positively related with the age of the firm. This implies that as the larger size of the firm comes through having been in existence for a longer duration in business

and will have built cordial relationship with the financiers who will in turn charge a lower interest in any finances advanced to the firms.

4.4.2 Regression Analysis

The determinants of net operating profitability are investigated for the 70 firm-year observations.

From Table 3 below, the established multiple linear regression equation becomes:

$$\text{NOP} = -0.887 - 0.007\text{ACP} - 0.009\text{IHP} + 0.14\text{APP} + 0.008\text{CCC} - 0.04\text{LEV} + 1.217\text{AGE}$$

The coefficient of intercept C has a value (-0.887) and is significant. The coefficient of inventory turnover in days is negative and highly significant at $\alpha = 5\%$, and implies that the increase or decrease in the inventory turnover in days, significantly affects profitability of the firm. It can be interpreted that if the inventory takes more time to sell, it will adversely affect profitability.

Table 3: Results of General Least Square

Model	Un-standardized Coefficients		Standardized Coefficients	t
	B	Std. Error	Beta	
1 (Constant)	-.887	.618		-1.436
ACP	-.007	.006	-.349	-1.249
IHP	-.009	.006	-.585	-1.566
APP	.140	.005	-.017	-.061
CCC	.008	.006	.568	1.349
LEV	-.040	.036	.135	1.118
AGE	1.217	.390	.425	3.121

Source: 2006 -2010 survey data, researchers' computation

The results of this regression indicate that the coefficient of accounts receivable is negative and is highly significant at $\alpha = 5\%$. It implies that the increase or decrease in accounts receivable will significantly affect profitability of the firm. The leverage ratio; it shows a significant negative relationship with the dependent variable, which means that, when leverage of the firm increases, it will adversely affect its profitability. Similarly the log of the firm's age is used as proxy for size of a company shows a significant positive relationship with profitability which means that bigger size firms have more profitability compared to firms of smaller size.

Table 4: Model Summary for NOP with Control Variables

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	F -statistic
1	.564 ^a	.318	.239	.6296886	59.4

Source: 2006 -2010 survey data, researchers' computation

The adjusted R^2 , also called the coefficient of multiple determinations, is the percentage of the variance in the dependent variable explained uniquely or jointly by the independent variables and is 56.4 %. This means that 56.4 % of the changes in the NOP will be explained by the changes in the independent variables and control variables in the model. The remaining 43.6% of the changes in the NOP is explained by other factors not in the model. The C is the constant, where the regression line intercepts the y axis, representing the amount the dependent y will be when all the independent variables are 0. Here C is -0.887; the probability of the coefficient is significant. The F statistic is used to test the significance of R. Overall; the model is significant as F-statistics is 59.4.

4.5 Discussion of Findings

Working capital management came out as an important parameter to be considered by a firm in projecting its profitability level as well as its influencing in liquidity. There should be a tradeoff between maximizing a firm's profitability and the need to have adequate liquidity level. This is because decisions that tend to maximize profitability tend to minimize the chances of adequate liquidity while at the same time, focusing almost entirely on liquidity will tend to reduce the potential profitability of the firm.

The findings were that the managers of the manufacturing firms considered spend most of their time in managing the current assets and current liabilities. This finding is similar to that found by Raheman and Nasr (2007) in a study of Pakistan firms which found out that manager of the firms spend up to 60% of their time managing these elements. The study concluded that the ACP, IHP and CCC have a negative correlation with the NOP. The results are similar to that found by Deloof (2003) except that in his case he found a positive correlation with cash conversion cycle. This difference could be due to the sample size between the two studies where in the current study, only one sector in this case – manufacturing firms was analyzed unlike the study by Deloof (2003) where the entire firms range quoted in the stock exchange in Britain was considered.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of the key findings of the study as well as the conclusions, limitations of the study, and recommendations for further research.

5.2 Summary

The secondary data in this analysis covered a period of 5 years from 2006 to 2010. The population of study comprised of manufacturing firms listed at the NSE that were in operation during the study period. After the screening process, firms whose accounts were not available in all the years of study or were not listed in full were eliminated and from this screening process 3 firms were eliminated leaving 14 to be studied in the research.

The research involved the use of regression analysis with net operating profit as the dependent variable while the average collection period, inventory holding period, average payment period and cash conversion cycle were the independent variables with leverage and age of the firm acting as the control variables. The t-statistic values and R^2 were used to determine the magnitude of the relationship between the dependent variable (NOP) and the independent variables (ACP, IHP, APP, CCC, LEV and AGE). In general, the results of general least squares method with cross section weights indicate the same interpretation that the working capital

management affects profitability of the company and that if the firm can effectively manage its working capital, it can lead to increasing profitability.

The study concluded that the ACP, IHP and CCC have a negative correlation with the NOP. All the independent variables had a significant relationship individually with the NOP. However, it was found out that APP, LEV and the AGE of the firm had a positive relationship with the NOP indicating that if the firm could lengthen these variables, then it will increase its profitability. Therefore it will be important for a firm's management to understand the relationship that exists between various working capital components and profitability and the direction that they affect the profit for effective management of the working capital.

5.3 Conclusions

Most of the Kenyan manufacturing firms have large amounts of cash invested in working capital. It can therefore be expected that the way in which working capital is managed will have a significant impact on profitability of those firms. The study found out existence of negative correlation between net operating profit and the firms average collection period, inventory holding period and the cash conversion cycle. These results suggest that managers can create value for their shareholders by reducing the number of day's accounts receivable and inventories to a reasonable minimum. The positive relationship between accounts payable and profitability is consistent with the view that more profitable firms wait longer to pay their bills.

On the basis of the above analysis it can further be concluded that these results can be strengthened if the firms manage their working capital and leverage in more efficient ways.

Management of working capital means management of current assets and current liabilities, and financing these current assets using cheap sources of finance. If these firms properly manage their cash, accounts receivables and inventories in a proper way, this will ultimately increase profitability of these companies.

5.4 Recommendations

It would be recommended that firms should generally adopt more stringent credit policies which would generate early payment by the customers in order to improve performance. As customers take less time to pay their debts, more cash becomes available to firms, enabling them to replenish inventory and the resultant higher sales realized lead to higher profitability of the firm. It would also be recommended that firms should carry out aggressive working capital policies by holding minimal stock. Maintaining low inventory levels and thus having low inventory holding period decreases both the holding and ordering cost of the stock and therefore leads to the increase of firm profits. Firms should also lengthen their accounts payment period since large firms wait longer to pay their bills. Firms should strive to decrease the cash conversion cycle in order to generate and have adequate cash flows for financing both operations and financing strategy in order to increase profitability. However, in implementing each of these recommendations, care should be taken not to exceed the limits beyond which the policies become counterproductive.

5.5 Limitations of the Study

The study examined the relationship between working capital management and profitability of

manufacturing firms in Kenya and so the findings may not necessarily apply to other sectors in the country. In addition, the manufacturing firms studied comprised only those quoted at the Nairobi Stock Exchange, hence other manufacturing firms in the country may not be adequately represented. Moreover, the study places more emphasis on financial measures of performance despite the fact that non-financial measures represent some of the major goals of world class manufacturing companies.

5.6 Suggestions for Further Research

It is suggested that further research be conducted on the same topic with different sector companies, covering manufacturing companies that are not listed at the NSE and extending the years of the sample. The scope of further research may also be extended to other components of working capital including cash, marketable securities, receivables and inventory management as well as incorporation of more control variables. It is also suggested that non-financial measures of performance which are increasingly becoming important in decision making and performance evaluation be considered in future studies.

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APPENDIX 1 : MANUFACTURING FIRMS LISTED AT THE NSE

Main Investment Market Segment

Industrial and Allied Sector

1. Athi River Mining co. Ltd
2. B.OC (K) Ltd
3. Bamburi Cement Ltd
4. BAT Ltd
5. Carbacid Investment
6. Crown Berger Ltd
7. E.A. Cables Ltd
8. E.A. Portland Ltd
9. EABL
10. Eveready E.A. Ltd
11. KenGen Ltd
12. Kenol Kobil Ltd
13. KPLC Ltd
14. Mumias Ltd
15. Sameer Africa Ltd
16. Total Kenya Ltd
17. Unga Group Ltd

APPENDIX II : SOURCE DATA

	Year	ACP	IHP	APP	CCC	LEV	NOP	Age
PORTLAND	2006	12.5	48.7	40.3	20.9	1.1	0.2	1.880814
	2007	18	49.6	29.6	38	0.9	0.2	1.886491
	2008	22.8	78	42.7	58.1	0.8	0.3	1.892095
	2009	17.5	52	39.6	29.9	0.7	0.2	1.897627
	2010	14.8	58.9	37.5	36.2	0.7	0.2	1.90309
KPLC	2006	106.3	92.8	97.7	101.4	0.8	0.3	1.929419
	2007	156.7	149.2	153.3	152.6	0.9	0.3	1.934498
	2008	101.5	200.1	210.5	91.1	0.9	0.2	1.939519
	2009	96.1	147.2	126.3	116.9	0.9	0.3	1.944483
	2010	92.9	149.2	44.8	197.3	0.8	0.2	1.079181
TOTAL	2006	33	77.7	67	43.7	3.8	0.6	1.716003
	2007	36.6	38.8	48.5	26.9	2.8	0.9	1.724276
	2008	32.3	35.5	23.4	44.4	3.4	0.9	1.732394
	2009	87.1	96.3	47	136.4	2.1	0.4	1.740363
KENGEN	2006	18.3	33.1	44	7.4	0.5	0.5	0.90309
	2007	12.2	33.2	26.6	18.8	0.4	0.7	0.954243
	2008	9.6	28.6	64.4	34	0.4	0.7	1
	2009	5.8	33.3	82.29	66	0.7	0.7	1.041393
	2010	89.1	61	54.6	95.5	0.7	0.2	1.079181
C BERGER	2006	58.3	176.5	110.4	124.4	1.5	0.4	1.681241
	2007	59.3	126.5	104.4	81.7	1.2	0.5	1.690196
	2008	66	140	79	127	1.5	0.4	1.69897
	2009	50	108.8	83.5	75.3	1.5	0.5	1.70757
	2010	50	81.9	52.5	79.4	1.6	0.5	1.716003
MUMIAS	2006	5.5	33.9	20.2	19.5	0.6	0.6	1.462398
	2007	16.4	28.1	29.8	14.7	0.4	0.6	1.477121
	2008	11	51.6	33	29.6	0.5	0.5	1.491362
	2009	5.3	34.5	38.5	1.3	0.6	0.2	1.477121
BAT	2006	0.3	106	48.4	57.9	0.8	0.3	1.732394
	2007	0.2	94.3	45.5	43	0.9	0.2	1.740363
	2008	2	92.4	47.4	47	0.9	0.3	1.748188
	2009	0.02	93	30	63.02	0.9	0.3	1.755875
	2010	0.6	102.6	26.4	76.8	0.9	0.4	1.763428
SAMEER	2006	42.6	165	64.4	143.2	1.5	0.3	1.568202
	2007	50.6	129	45	134.6	1.4	0.4	1.579784
	2008	46.6	157.8	28.5	175.9	1.1	0.4	1.591065

EABL	2009	34.8	132.3	18.3	148.8	0.8	0.5	1.60206
	2010	31.2	96.2	10.7	112.9	1.1	0.3	1.612784
	2006	19.8	18.9	6.1	13.7	0.6	2.2	1.924279
	2007	8.1	22.4	4.2	3.8	18.6	2.3	1.929419
	2008	14.5	144.3	23.2	135.6	0.2	2.5	1.934498
EA CABLES	2009	12.2	82.2	7	87.4	0.2	3.6	1.939519
	2010	19.8	67.2	2.6	84.4	1	3.6	1.944483
	2006	70.6	154.7	41.2	184.1	1.9	0.4	1.612784
	2007	77.4	115.6	30.7	162.3	1.9	0.5	1.623249
	2008	32	57.4	18.3	71.1	1.5	0.6	1.633468
BAMBURI	2009	66.1	91	42	115.1	1	0.4	1.643453
	2010	78.4	76.7	54	101.1	1.1	0.3	1.653213
	2006	5.4	77.7	53.4	29.7	0.3	0.6	1.518514
	2007	6.7	92.9	27.3	72.3	0.4	0.6	1.531479
	2008	6.2	101.3	38.6	68.9	0.5	0.6	1.544068
ARM	2009	0.8	64.9	23.4	42.3	0.5	0.4	1.556303
	2010	0.7	46.3	30.4	16.6	0.5	0.4	1.568202
	2007	21.1	62.9	60.1	71.2	0.8	0.3	1.531479
	2008	55.2	83.4	56.1	82.5	1	0.3	1.544068
	2009	69.1	109	78.8	99.3	0.9	0.2	1.556303
EVEREADY	2010	63.1	95.8	73.3	85.6	1	0.4	1.568202
	2006	27	125.2	18.7	133.5	2.7	0.6	1.591065
	2007	26.3	173.5	25	174.8	4.1	0.9	1.60206
	2008	34.6	109.2	24	119.8	2.4	0.9	1.612784
	2009	47	153	12.4	187.6	3	0.4	1.623249