THE RELATIONSHIP BETWEEN WORKING CAPITAL MANAGEMENT AND
THE VALUE OF COMPANIES QUOTED AT THE NAIROBI STOCK
EXCHANGE

BY

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2011
DECLARATION

I declare that this research project is my original work and has not been presented for the award of a degree in any other university.

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This research project has been submitted for examination with my approval as university supervisor.

Signed---------------------------------------------- Date----------
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DEDICATION

My most sincere dedication goes to my dear parents, Mr. Julius Waweru and Mrs. Grace Njoki for their good care and support since my childhood; Mum and Dad your inspiration, advice and guidance have made me what I am today; to you I will remain forever grateful. My heartfelt dedication also goes to my dear wife, Ann Njeri, my dear son Victor Waweru, my brothers Joseph Njama and Bernard Ndung’u for their patience, great love, support and encouragement during this research work.
ACKNOWLEDGEMENT

A number of people have contributed greatly to the completion of this research project and to them I owe my gratitude. First, I owe my sincere gratitude to the Lord God Almighty who has given me the opportunity to study to become all that He ordained that I be. All glory, laud and honour be unto His glorious Name.

I am deeply indebted to my Supervisor, Mrs. Winnie Nyamute for her invaluable assistance and scholarly comments.

Special thanks to my colleagues Mr. Patrick Mwangi and Mr. Solomon Karanja your company made learning more enjoyable and interesting. Rev. Francis Muchoki, and Pastor Stephen Kirweah your prayers have brought me this far; may God bless you

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ABSTRACT

A substantial amount of assets is held by Kenyan firms as working capital and thus the way working capital is managed is of great importance since they have a direct significant impact on the value of the firm. The purpose of this study was to determine the relationship between working capital management and value of the firm’s quoted in Nairobi Stock Exchange.

The study used secondary data obtained from annual reports and audited financial statement of companies listed on the Nairobi Stock Exchange. A sample of 22 companies listed on the Nairobi Stock Exchange for a period of seven years from 2003 to 2009 was studied. The average stock price was used to measure the value of the firm. Working capital components; average collection period, inventory turnover in days, average payment period, and cash conversion cycle were used as independent variables. Current ratio, size of the firm, fixed financial assets to total assets ratio and debt ratio were used as control variables. A descriptive statistics analysis was conducted on all the variables to give the general behavior of the firms quoted at the Nairobi Stock Exchange with respect to working capital management and value. Pearson correlation coefficient analysis was also conducted to establish the relationship among the variables. The relationship between the dependent variable, value and the other variables was conducted using a general regression model. To establish whether each of the independent variables had any significant relationship with the dependent variable a regression model was conducted separately between the dependent variable and each of the independent variables alongside the control variables.

The regression models indicated that there was some relationship between working capital management and the firm’s value. Both F-test and the coefficient of determination of variance indicated this relationship where the adjusted $R^2$ was 14% and F statistics had a value of 2.260. The $y$-intercept, $\beta_0$ was not zero meaning that there are other determinants of value apart from working capital management component. The result of Pearson correlation indicated a negative relationship between average cash collection period, inventory turnover in days, cash conversion cycle and value of the firm. It further
indicated a positive relationship between value of the firm and average payment period. This means that the managers can increase the value of their respective firms by handling correctly the cash conversion cycle and keeping each different component of working capital management at an optimal level. More specifically managers can increase value for their respective firms by reducing average cash collection period, inventory turnover period, cash conversion cycle and delaying payments to the suppliers.
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<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>ACP</td>
<td>Average collection period</td>
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<tr>
<td>ANOVA</td>
<td>Analysis of variance</td>
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<td>APP</td>
<td>Average payment period</td>
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<td>CCC</td>
<td>Cash conversion cycle</td>
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<td>CMA</td>
<td>Capital Markets Authority</td>
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<td>CR</td>
<td>Current ratio</td>
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<td>DR</td>
<td>Debt ratio</td>
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<tr>
<td>FATA</td>
<td>Financial assets to total asset</td>
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<td>ITID</td>
<td>Inventory turnover in days</td>
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<tr>
<td>NSE</td>
<td>Nairobi Stock Exchange</td>
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<tr>
<td>ROA</td>
<td>Return on Assets</td>
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<td>SPSS</td>
<td>Statistical Package for Social Science</td>
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CHAPTER ONE
INTRODUCTION

1.1. BACKGROUND OF THE STUDY

The major decisions of the firm are the investment, financing and the dividend decisions. The corporate finance literature has traditionally focused on the study of long-term financial decisions, particularly investments, capital structure, dividends or company valuation decisions. However, short-term assets and liabilities are important components of total assets and need to be carefully analyzed. Management of these short-term assets and liabilities warrants a careful investigation since the working capital management plays an important role in a firm’s profitability and risk as well as its value (Smith, 1980).

The analysis of the impact financing decisions has on the value of the firm started with Modigliani and Miller. Modigliani and Miller (1958) in their seminar paper described that the firm’s market value equals the present value of the cash flows it generates regardless of the capital structure it chooses. They made assumptions that the markets were efficient and there were no taxes. Modigliani and Miller relaxed the assumptions by introducing taxes into their model in which case the method of financing became relevant.

Myers (1974) argued that the value of the levered firm is equal to the value of the firm with no debt plus the present value of the tax saving due to the payment of interest. Myers proposes calculating the value of tax savings by discounting the tax savings at cost of debt. He argued that the risk of the tax saving arising from the use of debt is the same as the risk of debt.

Both MM and Myers focused on the long-term financing decisions and their effect on the value of the firm. More other studies have been conducted on the relationship between long-term financing decisions and the value of the firm, however little has been done on the relationship between short-term financing decisions and the value of the firm. There is therefore a staring gap and that is the reason why this study has been undertaken to find
out if there is any relationship between working capital management and the value of the firms quoted on Nairobi Stock Exchange (NSE).

The NSE is the principal stock exchange of Kenya. It began in 1954 as an overseas stock exchange while Kenya was still a British colony with permission of the London Stock Exchange. NSE is Africa's fourth largest stock exchange in terms of trading volumes, and fifth in terms of market capitalization as a percentage of Gross Domestic Products. Trading is done through the Electronic Trading System which was commissioned in 2006. A Wide Area Network platform was implemented in 2007 and this eradicated the need for brokers to send their staff (dealers) to the trading floor to conduct business. There is 55 quoted companies 47 in the Main Markets Investment Segment and 8 in the Alternative Markets Investment Segment.

In Kenya capital market have remained to be an important segment of the Kenya’s economy, Capital Market in Kenya is regulated by Capital Market Authority (CMA), where CMA supervises the trading of stocks and the operations of NSE. This is done to ensure the liquidity, solvency, and functioning of a stable capital markets. The CMA Act (2002) empowers CMA to carry regulatory function by ensuring that listing of companies is subjected to: appropriate procedure and rules governing licensing of players at the NSE, minimum capital requirements preparation of prospectus, informational requirements that need to be disclosed, number of shares to be issued and the rules on publication of statements of accounts.


Working capital management is a very important component of corporate finance because it directly affects the liquidity and profitability of a company. It deals with current assets and current liabilities. Excessive levels of current assets can result in a firm realizing sub-standard ration on investment and on the other hand, firms with too few current assets may incur shortages and difficulties in maintaining smooth operations (Horne et al, 2000). The main objective of working capital management is to maintain an optimal balance between each of the working capital components. Business success heavily depends on
the financial executives’ ability to effectively manage receivables, inventory, and payables (Filbeck et al, 2005). Firms can reduce their financing costs and/or increase the funds available for expansion projects by minimizing the amount of investment tied up in current assets. Most of the financial managers’ time and efforts are allocated towards bringing non-optimal levels of current assets and liabilities back to optimal levels (Lamberson, 1995).

More recently, creating value for a firm’s shareholders has been widely accepted as the key objective of the firm. It has been incorporated into the strategic management literature through value based planning (Hax et al., 1984). Value based planning entails identification of the value drivers in the firm; Rappaport (1987) has defined the value drivers as growth rate, operating profit margin, income tax rate, working capital investment, fixed capital investment, cost of capital and value growth duration. This implies that working capital management is one of the essential determinants of firms’ value because of its effects on the profitability. Hence efficient management of working capital is a fundamental part of the overall corporate strategy in creating the shareholders’ value.

Firms try to keep an optimal level of working capital that maximizes their value (Deloof, 2003). The management of the short-term assets and liabilities warrants a careful investigation since the working capital management plays an important role for the firm’s profitability and risk as well as its value (Smith, 1980). This study was aimed at establishing whether there is any relationship between working capital management and the value of the firms quoted in NSE for the period between 2003 and 2009. In order to achieve this objective working capital component will be analyzed using regression analysis. Stock price will be used as the dependent variable.

According to the ‘Efficient Market Hypothesis’, as defined by Fama, Eugene F. (1996), security prices fully reflect all available information. Whether security markets are informationally efficient is of great interest to investors, shareholders, managers, lenders,
standard setters and other market participants who care about intrinsic value of the firm. The value shareholders or investors place on a particular firm quoted on the NSE is reflected in the price they are willing to pay for each share. This is reflected on the daily share prices as reported on the NSE.

1.2. STATEMENT OF THE PROBLEM

The corporate finance literature has traditionally focused on the study of long-term financial decisions, particularly investments, capital structure, dividends or company valuation decisions. However, short-term assets and liabilities are important components of total assets and need to be carefully analyzed. Management of these short-term assets and liabilities warrants a careful investigation since the working capital management plays an important role in a firm’s profitability and risk as well as its value (Smith, 1980).

Working capital management as one of the management strategies has been used for the purpose of maximizing firm’s value, (Eljelly, 2004). A large number of business failures have been attributed to the inability of financial managers to plan and control properly the current assets and current liabilities of their respective firms (Smith, 1980). According to Deloof (2003) efficient management of working capital is a fundamental part of the overall corporate strategy in creating the shareholders’ value. Firms try to keep an optimal level of working capital that maximizes their value. This implies that there is a certain level of working capital requirement which potentially maximizes returns and hence the value of the firm.

In practice, working capital management has become one of the most important issues in the organizations where many financial executives are struggling to identify the basic working capital drivers and an appropriate level of working capital (Lamberson, 1995). In Kenya Nyaboke (2003) carried out a study on 34 companies quoted on the NSE on the relationship between debt financing and the value of the firms. The relationship was found to be weak for a large portion of individual companies as well as a cross sectors.
She concluded the value of the firm is to a large extent influenced by other factors besides debt. Bitok (2004) on the other hand conducted a study on the effect of dividend policy on the value of the firms quoted at the NSE, he found that the relationship between dividend policy and the value of the firms quoted on NSE was weak implying that there are other factors other than dividend policy that affect the value of the firm.

Companies listed at NSE are viewed as essential element of a healthy and vibrant economy. They are seen as vital to the promotion of an enterprise culture and to the creation of jobs within an economy (Apuoyo, 2010). In developing countries listed companies are believed to provide an impetus to the economic progress of developing countries and its importance is gaining widespread recognition. Owing to the contributions these companies have on the economy it is critical to identify the determinants of their value.

Specific research studies exclusively on the relationship between working capital management and the value of the firms are scanty, especially for the case of developing countries and in particular, Kenya. Keeping this in view and the wider recognition of the potential contribution of the quoted companies to the economies of developing countries, this study is a modest attempt to investigates the potential relationship between working capital management and the value of the firms listed on the NSE for the period 2003-2009. The findings of this study are expected to contribute to the existing literature of the working capital management.

Thus, as the working capital can be used by the managers to maximize the value of the firm, the problem statement can then go as; is there a significant relationship between efficient working capital management and the firm’s stock value? That is, can efficient working capital management affect the stock value of the companies quoted at the Nairobi Stock Exchange?
1.3. OBJECTIVE OF THE STUDY
To establish the relationship between working capital management and the value of the firms quoted at the Nairobi Stock Exchange.

1.4. IMPORTANCE OF THE STUDY
The knowledge from this study will be of great importance to the following groups:

**Finance managers**
This study will help the finance managers know the impact that their working capital management is likely to have on the value of their respective firms and hence make financial decisions accordingly.

**Investors**
This study should be of use to security analysts, financial analysts, stock brokers and other parties whose knowledge of the relationship between working capital management and value of the firm’s stock is important input into investment analysis and portfolio construction.

**Academics**
This study is meant to act as a base for further studies and also as a point of reference for both academicians and researchers for it will provide further insight into the characteristics of the Nairobi Stock Exchange.

**Economic Planners**
This study should be of use to the government to draw some knowledge on the relationship between working capital management and value of the firm. The knowledge can enable the government’s economic planners formulate policies that promote sound business environment especially during economic instability times.
CHAPTER TWO
LITERATURE REVIEW

2.1. INTRODUCTION
This chapter is about literature review on working capital management and value of the firm.

2.2. ORIGIN OF WORKING CAPITAL MANAGEMENT
Many surveys have indicated that managers spend considerable time on day-to-day problems that involve working capital decisions. One reason for this is that current assets are short-term investments that are continually being converted into other asset types (Rao, 1989).

The term working capital originated at a time when most industries were closely related to agriculture. Processors would buy crops in the autumn, process them, sell the finished product, and end up just before the next harvest, with relative low stock levels. Bank loans with maximum maturities of one year were used to finance both the purchase and the processing costs, and these loans were retired with the proceeds from the sale of the finished products (Bowker, 2008).

The concept of working capital was perhaps first evolved by Karl Marx between 1861 and 1864, though in a somewhat different form. Marx used the term ‘variable capital’ meaning outlays for payrolls advanced to workers before the goods they worked on were complete. He contrasted this with ‘constant capital’ which according to him, is nothing but ‘dead labour’ that is; outlays for raw materials and other instruments of production produced by labour in earlier stages which are now needed for live labour to work within the present stage (Bowker, 2008).

The ‘variable capital’ is nothing but wage fund which remains blocked in terms of financial management, in work-in-process along with other operating expenses until it is released through sale of finished goods. Although Marx did not mention that workers also
gave credit to the firm by accepting periodical payment of wages which funded a portion of work-in-process, the concept of working capital as we understand today was embedded in his ‘variable capital’ (Bowker, 2008).

The literature review in this area shows that majority of the early research did not link working capital management to a known efficiency measures. The early efforts attempted to develop models for optimal liquidity and cash balances, given the firms cash flow. The earlier cash management research focused on using quantitative models that weighed the benefits and cost of holding cash (Bowker, 2008). Under this category fall Baumol (1952) inventory management and Miller and Orr (1966) models which recognize the dynamics of cash flows. The benefit of these earlier models is that they help financial managers understand the problem of cash management, but they do require assumptions that may not hold in practice.

2.3. THEORIES OF WORKING CAPITAL MANAGEMENT

2.3.0. Quantity Theory of Money
According to the ‘quantity theory’ money is held only for purpose of making payments for current transactions. This theory was proposed by (Fisher, 1911). Irving Fisher’s version of the quantity theory can be explained in terms of the equation of exchange model; $MV = PT$, Where M is the nominal stock of money in circulation, V is the transaction velocity of circulation of money that is; the average number of times the given quantity of money changes hand in transactions, P is the average price of all transactions and T is the number of transactions that take price during the time period.

Both MV and PT measure the total value of transactions during the time period and so must be identical. Thus ‘the equation’ is really an identity which must always be true; it tells us only that the total amount of money handed over in transactions equal to the value of what is sold.
2.3.1. Keynesian theory of Money

Keynes (1936) in his work, the General Theory of Employment, Interest and Money identified three reasons why liquidity is important, the speculative motive, the precautionary and the transaction motive.

The speculative motive is the need to hold cash to be able to take advantage of, for example bargain purchase opportunities that might arise, attractive interest rates and in the case of international firms, favorable exchange rate fluctuations. For most firms, reserve borrowing ability and marketable securities can be used to satisfy speculative motives.

The precautionary motive is the need for a safety supply to act as financial reserve. Once again, there is probably a precautionary motive for liquidity. However, given that the value of money market instruments is relatively certain and that instruments such as Treasury bills are extremely liquid, there is no real need to hold substantial amount of cash for precautionary purpose.

Cash is needed to satisfy the transaction motive, the need to have cash on hand to pay bills. Transaction related needs come from collection activities of the firm. The disbursement of cash includes the payment of wages and salaries, trade debts, taxes and dividends.

2.3.3. Baumol Inventory Model

Baumol (1952) developed the inventory development model. The Baumol model is based on the Economic Order Quantity (EOQ). The objective is to determine the optimal target cash balance. Baumol made the following assumptions in his model; The firm is able to forecast its cash requirements with certainty and receive a specific amount at regular intervals; The firm’s cash payments occur uniformly over a period of time that is; a steady rate of cash outflows; the opportunity cost of holding cash is known and does not change over time; cash holdings incur an opportunity cost in the form of opportunity foregone; the firm will incur the same transaction cost whenever it converts securities to cash; cash transaction incurs at a fixed and variable cost.
The limitations of the Baumol model are as follows; assumes a constant disbursement rate; in reality cash outflows occur at different times, different due dates; assumes no cash receipts during the projected period, obviously cash is coming in and out on a frequent basis; no safety stock is allowed for, reason being it only takes a short amount of time to sell marketable securities.

2.3.4. The Modern Quantity Theory
Friedman (1956) restated the quantity theory of money, a theory of demand for money and this “modern quantity theory” has become the basis of news put forward by monetarists. In this theory, money is seen as just one of a number of ways in which wealth can be held, along with all kinds of financial asset, consumer durables, property and human wealth. According to Friedman, money has a convenience yield in the sense that its holding saves time and effort in carrying transactions.

2.3.5. Miller and Orr’s cash management Model
Miller and Orr (1966) came up with another model of cash management. As per the Miller and Orr’s model of cash Management the companies let their cash balance move within two limits the upper limit and the lower limit. The companies buy and sell the marketable securities only if the cash balance is equal to any one of these. The model rectified some of the deficiencies of the Baumol model by accommodating a fluctuating cash flow situation stream that can either be inflow or outflow. The Miller-Orr’s model has an upper limit and lower limit as shown in the diagram below:
When the cash balance of a company touches the upper limit, it purchases a certain number of saleable securities that helps them to come back to the desired level. If the cash balance of the company reaches the lower level then the company trades its saleable securities and gathers enough cash to fix the problem.

It is normally assumed in such cases that the average value of the distribution of net cash flow is zero. It is understood that the distribution of net cash flows has a standard deviation. The Miller and Orr’s model of cash management also assumes that distribution of cash flow is normal. The Miller and Orr’s cash management model is widely used by most business entities.

2.3.6. Treasury approach to cash management
Johnson and Aggarwal (1998) developed a cash management model focusing on cash flows and argued that cash collection and cash payment processes should be handled independently. This entails that cash collection and payment management cycles should be broken into their constituent parts.

2.3.7. Operating cycle theory
Park and Gladson (1963) held that the one year temporal standard to determine the currentness was arbitrary and not universally valid. What was current or noncurrent depended on the nature of core business activity marked by technological requirements.
and trading practices. They used the term ‘natural business year’ within which an activity cycle is completed. The yardstick for judging currentness of an item, both assets and liabilities, would be ‘natural business year’. The ‘natural business year’ concept was developed later into operating cycle (OC) theory of working capital.

Operating cycle theorists claim that money is blocked first in raw materials, labour and other conversion costs come later, selling and distribution costs come at the end. Thus all items do need cash support for the entire operating cycle days. Hence the need to aggregate working capital could be more accurately derived by considering each component of working capital. The diagram below shows the flow of cash in the working capital cycle

**Figure 2.3 2: Operating cycle Model**

![Operating cycle Model](image)

Each component of working capital (namely inventory, receivables and payables) has two dimensions **TIME** and **MONEY**. When it comes to managing working capital - **TIME IS MONEY**. If you can get money to move faster around the cycle (e.g. collect monies due from trade receivables more quickly) or reduce the amount of money tied up (e.g. reduce inventory levels relative to sales), the business will generate more cash or it will need to borrow less money to fund working capital. As a consequence, you could reduce the cost of bank interest or you will have additional *free* money available to support additional sales growth or investment. Similarly, if you can negotiate improved terms with suppliers
e.g. get longer credit or an increased credit limit; you effectively create *free* finance to help fund future sales.

It can be tempting to pay cash, if available, for fixed assets e.g. computers, plant, vehicles etc. If you do pay cash, remember that this is now longer available for working capital. Therefore, if cash is tight, consider other ways of financing capital investment - loans, equity, leasing etc. However, if dividends are paid or drawings are increased, these are cash outflows and they remove liquidity from the business.

### 2.4. FIRM VALUATION

Valuation is the process of forecasting the present value of the expected payoffs to shareholders and of converting this forecast into one number that corresponds to the fundamental-intrinsic firm value. Lee et al.,(1999), argues that valuation models are merely ‘pro forma accounting systems’ that constitute the vehicles for articulating the assessment of future events typically in terms of accounting constructs.

According to Barker (2001), a good understanding of valuation methods requires two main things. The first is an analytical review of the models, identifying their relationship and exposing their assumptions. The second is an evaluation of the data that are available for use of these models. Therefore, there is a significant relationship between the choice of valuation models and the available data.

#### 2.4.0. Asset Based Valuation Model

This approach assigns a value to the firm based on the fair value of individual component assets. This model can be applied when the balance sheets are perfect that is the assets and liabilities are recorded at fair market value. Since they are priced efficiently in the market, they will earn at their cost of capital. The substance value which is also the equity is thus estimated as assets minus liabilities (Nilsson et al., 2002, p.301).
The model can be used for valuing small private companies where the cash flow is difficult to forecast (Nilsson et al, 2002, p.301). Therefore, this model is useful in valuing firms with large fixed assets and firms applying simple technology.

Nilsson et al, (2002) argues that it is important to define net book value, adjusted book value and liquidation value in order to understand the model. Net book value is the accounting cost of the asset less the depreciation to date, adjusted book value is the book value adjusted to market value and liquidation value is the value of a firm if it’s going concern assumption is not holding i.e. without considerations of future. It’s the value of a firm if it were to be wound up at that point in time.

Asset based valuation method is not accurate when valuing firms with assets in form of patents and contingent liabilities. The method also assumes a constant pattern in depreciation which may not always be the case. Hirt & Block (2000) recommend the method to be used only in valuing firms heavily dependent on their present asset holding.

2.4.1. Discounted Valuation Models
These models assign a value to the firm that equals the present value of expected future accounting measures, based on all currently available information. The parameters that make up Discounted Valuation Models are related to risk (the required rate of return) and the return itself (Copeland, et al., 2000).

Discounted cash flows methodologies are developed to analyze values in the light of a firm’s future earnings. These valuation methods consider firm earnings for a number of forecasted years into the future, quite often in practice, ten years is used. These earnings are then discounted back to present value that is the value of future earnings stated in today’s dollar. (Hurly & Hult,(1998).
These models use three alternative cash flow measures namely: Free cash flows, Dividends and Accounting earnings. Under the assumption of perfect markets, these models give the same results as the asset-based valuation model.

2.4.1.1. Free Cash Flow Model
This model assumes that the firm’s value equals the present value of cash flows from all the projects in its operations. Free cash flow is the difference between the cash flow from operations and cash investment. It is the cash available to debt and firm holders after investment. The Free Cash Flow Model (FCF) is specified by Copeland, et al., (2000) as:

$$V^*_t = \sum \frac{E_t (FCF_t)}{(1+r_t)i} + ECMS_t - D_t - PS_t$$

Where:
- $V^*_t$ is the market value of Firm at time $t$,
- $FCF_t$ is the free cash flow to the firm,
- $r_t$ is the weighted average cost of capital,
- $ECMS_t$ is the excess cash and marketable securities,
- $D_t$ is market value of debt and;
- $PS_t$ is the market value of preferred stock at time $t$.

Modigliani and Miller (1958) in their seminar paper described that the firm’s market value equals the present value of the cash flows it generates regardless of the capital structure it chooses. They made assumptions that the markets were efficient and there were no taxes. Modigliani and Miller’s seminar papers (1958, 1963) gave rise to two alternative discount rates for project and firm valuations: the Weighted Average Cost of Capital (WACC) and Adjusted Present Value (APV). MM relaxed the assumptions by introducing taxes into their model in which case the method of financing become relevant. APV - Discounts the cash flows before allowing for debt capital but allowing for tax relief obtained on the debt capital.
According to Myers (1974) the value of the levered firm is equal to the value of the firm with no debt plus the present value of the tax saving due to the payment of interest. Myers proposes calculating the value of tax savings by discounting the tax savings at cost of debt. He argued that the risk of the tax saving arising from the use of debt is the same as the risk of debt.

The value of the firm is obtained by discounting the free cash flow to the firm at the weighted average cost of capital. Embedded in this value are the tax benefits of debt (in the use of the after-tax cost of debt in the cost of capital) and expected additional risk associated with debt (in the form of higher costs of equity and debt at higher debt ratios). Just as with the dividend discount model and the FCFE model, the version of the model used will depend upon assumptions made about future growth (Koller et al., 2000).

2.4.1.2. Dividend Discount Model
The model assumes that a stock's fundamental firm value can be defined as the present value of its expected future dividends based on all currently available information. Gordon (1962) proposed the dividend growth model now popularly known as the Gordon’s growth model. According to this model the equity of a firm with a dividend stream growing at a constant rate can be valued as follows

\[ P = \frac{D_0 (1+g)}{k-g} \]

Where \( D_0 \) -is the dividend paid and \( g \)- is the expected growth rate in perpetuity. \( P \)- is the price of equity, \( k \)- is the required rate of return on equity.

2.4.1.3. Accounting Earnings-Based Valuation
Under this approach, a firm’s equity value can be expressed as the sum of the expected earnings, discounted at an appropriate risk-adjusted discount rate:

\[ V^* = \sum \frac{E^t (X^t+1)}{(1+re)^t} \]
In the case that the expected future annual income level $E(X)_t$ is constant, the ‘capitalization of earnings’ approach can be applied:

$$V^*_t = \sum_{r^*} \frac{Et(X)}{r^*}$$

where $r^*$ is the risk adjusted capitalization rate.

Unlike the asset-based approach, this model can capture unrecorded goodwill, that is, the difference between the book value and market value of the firm’s assets. The earnings-based model is often applied to firms such as technology intensive firms (computer firms, telecommunication firms) that have considerable unrecorded intangible assets and high expected future cash flows. (Gordon, 1962).

### 2.4.2. Discounted- Residual Income Model

This model is sometimes referred to as Edwards-Bell-Ohlson. It is generally considered to be the most reliable model for firm valuation. It provides a way of thinking about value generation in the business. It is an accrual accounting model where the central concept is the residual income, a measure of accounting income in excess of a normal/required return on capital employed. According to the model of Ohlson (1995), the parameters that make up the Discounted Residual Income Model are:

$$V^*_t = B + \sum \frac{Et[NI_{t+i} - (r_c^* B_{t+i-1})]}{(1+r_c)^i} = B + \sum \frac{Et[(ROE_{t+i} - re^*) B_{t+i-1}]}{(1+r_c)^i}$$

Where:

- $B_t$ is the book value at time $t$,
- $B_{t+i-1}$ is the beginning-of-year book value at $t$,
- $Et[.]$ is expectation based on information available at time $t$,
- $NI_{t+i}$ is the Net Income for period $t+i$,
- $re$ is the cost of Firm capital and;
- $ROE_{t+i}$ is the after-tax return on book Firm for period $t+i$. 

17
This is the Residual Income Model (RIM) which shows that firm value can be split into two components: an accounting measure of the capital invested \((B_t)\), and a measure of the present value of future residual income, defined as present value of future discounted cash flows not captured by the current book value. If a firm earns future accounting income at a rate exactly equal to its cost of Firm capital, then the present value of future residual income is zero, and \(V_t = B_t\) (Ohlson, 1995). In other words, firms that neither create nor destroy wealth relative to their accounting-based shareholders' firm will be worth only their current book value. However, firms with expected ROEs higher (lower) than \(re\) will have values greater (lower) than their book values. Therefore, the RIM is a combination between asset-based valuation model for firm’s financial activities and earnings-based model for operating activities. Since it incorporates firm’s stock and flow components, it is most applicable to companies with high fixed and intangible assets and whose values are generated by both assets and future stream of earnings (Ohlson, 1995).

Modern portfolio theory shows that specific risk can be removed through diversification. The trouble is that diversification doesn’t solve the problem of value of the firm; even a portfolio of all the shares in the stock market cannot eliminate that risk. Therefore, when calculating a deserved return, value of the firm is what plagues investors most. CAPM, therefore, evolved as a way to measure this value of the firm.

2.5. EMPIRICAL TESTS ON WORKING CAPITAL MANAGEMENT AND THE VALUE OF THE FIRM

Shin and Soenen (1998) in their study on the relationship between the length of Net Trading Cycle, corporate profitability and risk adjusted stock return using correlation and regression analysis, by industry and capital intensity highlighted that efficient Working Capital Management was very important for creating value for the shareholders. The way working capital was managed had a significant impact on both profitability and liquidity. They concluded that a strong negative relationship between lengths of the firm’s net trading cycle and its profitability. In addition, shorter net trade cycles were associated with higher risk adjusted stock returns.
Deloof (2003) discussed that most firms had a large amount 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. Using correlation and regression tests he found a significant negative relationship between gross operating income and the number of days of trade receivable, inventories and trade payables of Belgian firms. On basis of these results he suggested that managers could create value for their shareholders by reducing the number of days’ trade receivable and inventories to a reasonable minimum. The negative relationship between trade payable and profitability firms wait longer to pay their bills.

Raheman and Nasr (2007) carried out a study on working capital management and profitability, a case of 94 Pakistan firms on Karachi Stock Exchange for a period of six years 1999-2004. Their main objective was to establish the relationship between working capital management and profitability of a firm. Their findings were that there was a negative relationship between net operating profitability and the average collection period, inventory turnover in days, average payment period and cash conversion cycle for the sample of Pakistan firms listed on the Karachi stock exchange. The results suggested that managers can create value for their shareholders by reducing the number of days of accounts receivable and inventory to a reasonable minimum. The negative relationship between account payable and profitability was consistent with the view that less profitability firms wait longer to pay their bills.

Afza and Nazir (2007) investigated the relationship between the aggressive and conservative working capital policies for 17 industrial groups and a large sample of 263 public limited companies listed on Karachi Stock Exchange using cross-sectional data for the period 1998-2003. Using Analysis of Variance and Least Significant Difference test, the study found significant differences among their working capital investment and financing policies across different industries. Moreover, rank order correlation confirmed that these significant differences were remarkably stable over the six-year study period. Finally, ordinary least regression analysis found a negative relationship between the
profitability measures of firms and the degree of aggressiveness of working capital investment and financing policies.

In Kenya, Kithii (2008) carried out a study on the relationship between working capital management and profitability of listed companies on Nairobi stock exchange. Her objectives were to establish how efficient the firms are in managing their working capital. She also aimed at establishing the relationship between profitability, the cash conversion cycle and its components for the listed companies on the Nairobi stock exchange for the period 2001-2006. The results showed that there is a statistical significant negative relationship between variables of working capital management and the profitability of firms except for the average payment period which showed a positive relationship.

Ochieng (2006) carried out a study on firms quoted on the Nairobi stock exchange over the last twenty years on the relationship between working capital and the Economic Activities in Kenya. The objective of the study was to examine how the changes in economic activities affect changes in working capital by firms listed on the Nairobi stock exchanges. The findings revealed that the liquidity of the small firms as measured by the current and quick ratios increased slightly during economic slowdown. The study also shows that the liquidity positions reacted differently to various economic indicators such as inflation and lending rates. With lending rates, the study found that lending rates indeed did affect the amount of working capital for the firms and this further showed that during times of economic contraction, working capital positions of the firms improved.

Mwangi (2010) conducted a study on the relationship between working capital management and the systematic risk of companies quoted in NSE. A sample of 22 companies listed on the Nairobi Stock Exchange for a period of seven years from 2003 to 2009 was studied to determine the relationship between working capital management components and beta. Current ratio, size of the firm (measured in terms of natural logarithm of sales), fixed financial assets to total assets ratio and debt ratio we used as control variables. Pearson’s correlation and regression analysis (pooled least square) were used for analysis. The results showed that there was no statistical significant relationship
between variables of working capital management and the beta of a firm. This means that the manager may not mitigate systematic risk of a firm by handling correctly the cash conversion cycle and keeping each different component of working capital management at an optimal level.

Apuoyo (2010) carried out a study on the relationship between working capital management policies and profitability for companies quoted at the NSE. Proportionate random stratified sampling procedure was used to come up with the sample. The study covered the period between 2005 and 2009. In his conclusion he found a positive relationship between conservative working capital management policy and the profitability of the companies quoted at the NSE. The results also showed that there were significant differences between the working capital management policies across the five sectors.

Yator (2010) carried out a survey of working capital management practices by secondary schools in Elkeiyo-Marakwet County. The objective was to establish whether secondary schools have any working capital management policy. A descriptive survey study was used and data collected using semi structured questionnaires. The finding from 79 schools sampled in the Keiyo County was that they don’t have a working capital management policy.

Nyaboke (2003) conducted a study on the relationship between debt financing and the value of the firms quoted on the NSE. The objective of the study was to find out whether there exists a relationship between debt and the value of Kenyan firms quoted on the NSE. She used a sample of 34 companies quoted on the NSE for the period 1993 to 2001. She observed that there is a weak relationship between debt and the value of the firm. Hence changes in the debt level may not have a significant effect on the value of the quoted firms. Thus the findings from her study did not support the study conducted by Modigliani and Miller (1963/58). This is because there seems to be no significant relationship between debt and value of the firm.
Gathuiya (2005) conducted a study on the relationship between NOI and the value of the firms quoted on the NSE for a period between 1994 and 2002. 47 firms were analyzed using regression analysis. F-ANOVA test showed that the relationship is stastically significant for all the firms understudy. He concluded that there is a significant relationship between NOI and value of the firm.

Bitok (2004) conducted a study on the effect of dividend policy on the value of the firm firms quoted at the NSE. The study covered a period of 6 years (1998-2003). He concluded that divided policy was relevant as regards the value of the firm. However, the relationship between dividend policy and the value of the firms quoted on NSE was weak implying that there are other factors other than dividend policy that affect the value of the firm.

Chege (2006) carried out a survey of valuation methods used by business valuation practioners in Kenya. The objectives of the study were to find out which methods are preferred by the practioners and the reasons for the use of those methods. He used a sample size of 96 companies which included accounting firms, investment bankers, stock brokers and investment advisory firms. The primary data was collected through questionnaire and the data collected was analyzed through descriptive statistics and presented in tabular and graphical formats. The finding of the study was that the discounted cash flow method is the most widely used method.

Shawn Allen (2002) concludes that free cash flow is a superior performance and value indicator, but only if investors take the time to understand it and how to calculate it properly. The so called cash flows that most organizations and many analysts quote is flawed as a measure of true cash flow that a company is generating because it usually omits the necessary capital spending to replace worn out assets.

2.6. Summary of Literature review
The chapter reviews the origin of working capital management by Bowker, (2008) and the related models; the quantity theory of money; the Keynesian theory of money-the
speculative motive, the precautionary motive, the transaction motive; the Baumol inventory model; the modern quantity theory; the Miller and Orr’s cash management model; the treasury approach to cash management and operating cycle theory. It also reviews the various approaches to determining the value of the firm, the empirical tests on the relationship between Value of the firm and Working capital management.

From these empirical studies it is clear that much has not been done to determine the relationship between working capital management and the value of the firm. Therefore, there is a need to establish how firms’ stocks specifically responded to working capital management practices of the firms quoted at the Nairobi Stock Exchange. This calls for the measure of value of the firm in relation to working capital management. Thus, a study on the relationship between working capital management practices and the value of the firm needs be carried out.
CHAPTER THREE
RESEARCH METHODOLOGY

3.1. INTRODUCTION
This chapter describes the procedures involving research design; population of the study, the sample size and sampling procedures; data collection procedures and data analysis techniques that was followed in conducting the research.

3.2. RESEARCH DESIGN
The main purpose of this research was to determine the effect of a firm’s working capital management on its value in Kenya. This is a causal relationship study between working capital management and its effects on the value of the firms listed on the Nairobi Stock Exchange. The research used both descriptive and quantitative research design. Descriptive research was used as a pre-cursor to quantitative research designs, as it provides the general overview giving some valuable pointers as to what variables are worth testing quantitatively. This was appropriate since it offered the researcher dual opportunities of observing and analyzing the historical data without bias.

3.3. THE POPULATION
The population of interest in this study constitutes all companies quoted at the NSE for the period of 7 years from 2003 and 2009. The period was selected due to the changes in political environment that were experienced in the country in the year 2002 which the researcher believes could have some effects on the value of the firm as reflected in the share prices. The study was limited to quoted companies due to lack of readily available data from private companies. There were 55 companies listed on NSE during the period.

3.4 THE SAMPLE
The study was based on financial statements of the selected firms listed on the Nairobi Stock Exchange for the period of 7 years from 2003 and 2009. In order to come up with the sample, firms to be selected were those that had been in the business for the whole study period. The firm merged and de-listed from the Nairobi Stock Exchange, due to any
reason/restriction imposed by the regulators during the period under consideration was ineligible for inclusion in the study. New incumbents in the market during the study period were not included in the sample. Because of the specific nature of their activities, firms in financial sector; banking, insurance, leasing business, service rendering and other services were excluded from the sample. Furthermore firms selected were those that had complete data for the period 2003-2009.

3.5. DATA COLLECTION

The data used in this study was secondary data. Data on prices was obtained from Nairobi Stock Exchange Handbook and website. The other data on the working capital management was obtained from financial statements (audited statement of financial position and statement of comprehensive income) of listed companies at the NSE. A data collection form (appendix 111) designed to record sales, cost of sales, total assets, financial assets, trade receivables, trade payables, inventories and total debts, annual stock prices, non-current liabilities was used. This was aimed at coming up with valid empirical evidence to the issues of the relationship between working capital management and value of the firm.

3.6. DATA ANALYSIS

To determine the relationship between working capital management and value of the firms listed on the Nairobi Stock Exchange, two types of data analysis was used; descriptive and quantitative analysis.

The variables

The research was aimed at analyzing the relationship between Working Capital Management and value of the firms’ quoted at the Nairobi Stock Exchange. The data collection procedure was achieved by developing a similar framework used by Shin and Soenen (1998), Deloof (2003), Afza and Nazir (2004), Raheman and Nasr (2007) Nyaboke (2003), Mwangi (2010) and Kithii (2008). The following data was used to come up with the required variables; The stock prices at the beginning and end each year; Trade receivables; Trade payables; Inventories; Current assets; Current liabilities; Total sales;
Total cost of sales; Financial assets; Non-current assets; Long term debt; They include dependent, independent and control variables.

**Dependent Variable**

The market price per share as reported in NSE handbooks and websites was used to measure value of the firm and was hereby used as dependent variable. The price used to measure the value of the firm was the average of annual opening price and annual closing price. The share price was used to measure the value of the firm because they consider market conditions and therefore can give an accurate estimate of the value of the firm. (Nyaboke, 2003).

**Independent Variables**

The Average collection period (ACP) calculated by dividing trade receivable by sales multiplied by 365 days, Average payment period (APP) calculated by dividing trade payable by cost of sales multiplied by 365 days, Inventory turnover in days (ITID) calculated by dividing the average inventories by cost of sales multiplied by 365 days and Cash conversion cycle (CCC) calculated as a sum of the average collection and inventory turnover in days minus average payment period was used as independent variables.

**Control Variables**

The size natural logarithm of total assets (SIZE), Current ratio (CR), the ratio of current assets and current liabilities, debt ratio (DR) used as proxy for leverage and calculated by dividing total debt by total assets, and the ratio of financial assets to total assets FATA was included as control variables. Fixed financial assets are the shares in other firms, intended to contribute the activities of the firm holding them by establishing a lasting and specific relationship and loans that are granted for the same purpose (Eljelly, 2004). For some firms such assets are significant part of their total assets and hence will be included as control variables in the regression.
3.6.1. Descriptive Analysis

Description analysis was the first in the analysis; it helped in describing relevant aspects of phenomena of cash conversion cycle and provides detailed information about each relevant variable. Descriptive statistics like mean, median and standard deviation was used to describe the different variables of interest in the study. SPSS software was used for analysis of the different variables in this study.

3.6.2. Quantitative Analysis

Two methods of quantitative analysis were applied in this study. One method used is correlation models specifically Pearson correlation to measure the degree of association between different variables under consideration. The other method is multiple regression analysis that estimates the causal relationships between stock price and other chosen variables. Generalized Least Squares (Cross section weights) method was applied for analysis. The use of panel data in a pooled regression where time-series and cross-sectional observations was combined and estimated. This means that, several cross-sectional units were observed over a period of time in a panel data setting.

At first, correlation was used to measure the degree of association between different variables under consideration. Many important variables associated with working capital management were identified. As multiple variables are influencing the problem in hand, the crucial factors associated with working capital management were identified. Pearson correlation was calculated for all variables used in the study.

3.6.3. Pearson’s Correlation Coefficient Analysis

Pearson’s Correlation analysis was used for data analysis to see the relationship between variables such as those between working capital management and value of the firm.

3.6.4. Regression Analysis

For the purpose of identifying the important variables influencing the dependent variable, the regression analysis was used. In panel data (pooled) regression, time –series and
cross-sectional observations were combined and estimated. Panel is more useful in studying the dynamics of adjustment, and is better able to identify and measure effects that are simply not detectable in pure cross-sections or pure time-series data. Moreover, many variables can be more accurately measured at the micro level and biases resulting from aggregation over firms or individuals are eliminated (Raheman and Nasr, 2007). Regression analysis was used to investigate the impact of working capital management on corporate share price.

3.6.5. Hypotheses Testing

The objective of this study was to examine the relationship between working capital management (the cash conversion cycle and its components for companies on the Nairobi stock exchange for the period 2003-2009) and stock value. To achieve this, the study makes the testable hypothesis (the null hypothesis Ho: verses the alternative hypothesis H1) as follows:

H₀: There is no relationship between efficient working capital management and value of the firms quoted in NSE.

H₁: There is a possible positive relationship between efficient working capital management and value of the firms quoted in NSE.

3.6.6. Model Specifications:

The study used panel data regression analysis of cross-sectional and time series data. The pooled regression type of panel data analysis was used. The pooled regression, also called the constant coefficients model is one where both slopes are constant, where the cross section firm data and time series data are pooled together in a single column assuming that there is no significant cross section or temporal effects.

The general form of the model is:

\[ P_{it} = \beta_0 + \sum_{i=1}^{n} \beta_i X_{it} + \epsilon, \]
$P_{it} : \text{Stock price of firm at time } t; \ i=1,2, \ldots, \ 55 \text{ firms}$

$\beta_0: \text{The intercepts of equation}$

$\beta_i : \text{Coefficients of } X_{it} \text{ variables}$

$X_{it}: \text{The different independent variables for working capital management of firm } i \text{ at time } t.$

$t : \text{Time } = 1,2, \ldots, \ 7 \text{ years.}$

$\varepsilon: \text{The error term}$

Specifically, when the above general least squares model is converted into our specified variables it becomes:

$V_0 = \beta_0 + \beta_1 (ACP_{it}) + \beta_2 (ITID_{it}) + \beta_3 (APP_{it}) + \beta_4 (CCC_{it}) + \beta_5 (CR_{it}) + \beta_6 (DR_{it}) + \beta_7 (SIZE_{it}) + \beta_8 (FATA_{it}) + \varepsilon$

Where:

$V_0: \text{market price per share}; \ \beta_0: \text{The intercepts of equation}; \ ACP: \text{Average Collection Period}; \ ITID: \text{Inventory Turnover in Days}; \ APP: \text{Average Payment Period}; \ CCC: \text{Cash Conversion Cycle}; \ CR: \text{Current Ratio}; \ DR: \text{Debt Ratio}; \ SIZE: \text{Natural logarithm of Total Assets}; \ FATA: \text{Financial Assets to Total Assets}; \ \varepsilon: \text{The error term}$
CHAPTER FOUR

DATA ANALYSIS, PRESENTATIONS AND INTERPRETATIONS OF FINDINGS

4.1. INTRODUCTION

This chapter focused on data analysis, interpretation and presentation of the findings. The researcher made use of descriptive statistics and quantitative analysis to present data.

4.2. DESCRIPTIVE ANALYSIS

Descriptive analysis presents the mean, standard deviation, maximum values, and minimum values of the different variables in this study.

Table 4.2.1: Descriptive statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRICE</td>
<td>154</td>
<td>4.13</td>
<td>319.50</td>
<td>66.1830</td>
<td>60.8356</td>
</tr>
<tr>
<td>ITD</td>
<td>154</td>
<td>8.00</td>
<td>279.00</td>
<td>98.1818</td>
<td>60.3736</td>
</tr>
<tr>
<td>APP</td>
<td>154</td>
<td>1.00</td>
<td>622.00</td>
<td>113.1039</td>
<td>84.9532</td>
</tr>
<tr>
<td>ACP</td>
<td>154</td>
<td>9.00</td>
<td>443.00</td>
<td>74.9416</td>
<td>45.1188</td>
</tr>
<tr>
<td>CCC</td>
<td>154</td>
<td>.00</td>
<td>420.00</td>
<td>83.0698</td>
<td>69.3434</td>
</tr>
<tr>
<td>DR</td>
<td>154</td>
<td>.00</td>
<td>1.15</td>
<td>.2895</td>
<td>.2328</td>
</tr>
<tr>
<td>SIZE</td>
<td>154</td>
<td>8.21</td>
<td>18.07</td>
<td>14.6837</td>
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<tr>
<td>CR</td>
<td>154</td>
<td>.50</td>
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<td>1.9016</td>
<td>1.8479</td>
</tr>
<tr>
<td>FATA</td>
<td>154</td>
<td>.00</td>
<td>.28</td>
<td>0.03524</td>
<td>0.06588</td>
</tr>
</tbody>
</table>
Source: The descriptive analysis of all the variables in the study using SPSS software for 22 Kenyan Non-financial firms, 2003-2009, 154 firms-year observations.

Table 4.2.1 above shows the mean, standard deviation, minimum values and maximum values for 22 companies listed on Nairobi Stock Exchange for 154 firms-year observations from year 2003 to year 2009. The cash conversion cycle used as a proxy to check the efficiency in managing working capital is on average 83 days and standard deviation is 69 days. The average number of days a firm takes to receive payment after sales is 75 days with a standard deviation of 45 days while the Minimum time and maximum time taken by a company to collect cash from receivable is 9 and 443 days respectively. To convert inventory to receivables it takes a firm an average of 98 days with standard deviation of 60 days. The minimum time a firm takes to convert inventories to sales is 8 days while the maximum time taken is 279 days which is slightly less than one year. The minimum and maximum period taken by firms to pay for the purchases is 1 and 622 days respectively. On average firms take 113 days to pay trade creditors purchases with a standard deviation of 85 days.

4.3. QUANTITATIVE ANALYSIS

Pearson and spearman correlations are calculated for all the variables used in the study starting with the Pearson correlation results.

4.3.1. Pearson’s correlation coefficients analysis

Efficient working capital management is expected to have a positive relationship with the value of the firm. 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 the value of the firm.

Appendix I: Presents Pearson correlation coefficients for all variables considered

The analysis of correlation results between the inventory turnover in days and firm’s value shows a negative coefficient -0.088, with p-value of 0.276 with $\alpha = 5\%$ significance
level. This means that the higher the period of converting inventory to sales the lower the value of the firm. There is therefore a negative relationship between ITD and value of the firm. The correlation results between ACP in days and the value of firms also indicates the same type of result where the correlation coefficient is -0.135, a p-value of 0.096 at a significance level of α = 5%. The correlation result of CCC shows correlation coefficient of -0.295 and p-value of 0.001. The correlation result of APP shows positive coefficient 0.297 and significant α = 5%. The results of working capital components indicates that firm’s managers can increase the value of their respective firms by reducing inventory turnover period, average collection period, cash conversion period and increasing average payment period. By analyzing the results a conclusion can be drawn that if the firm is able to reduce and increase these time periods as appropriate then the firm is efficient in managing working capital. This efficiency will lead to increasing the value of the firm.

The results of correlation analysis indicate that as far as Kenya firms are concerned, the working capital management significantly affects their value.

4.3.2. Regression analysis

The researcher conducted a multiple linear regression analysis so as to determine the relationship between the value of the firm and the eight independent variables; Inventory Turnover in Days; Average Payment Period; Cash Conversion Cycle; Current Ratio; Debt Ratio; Natural logarithm of total asset; Financial Assets to Total Assets; The error term for 7 years. The regression equation is

\[ V_{it} = \beta_0 + \beta_1 (ACP_{it}) + \beta_2 (ITID_{it}) + \beta_3 (APP_{it}) + \beta_4 (CCC_{it}) + \beta_5 (CR_{it}) + \beta_6 (DR_{it}) + \beta_7 (SIZE_{it}) + \beta_8 (FATA_{it}) + \varepsilon \]

Where: \( V_{it} \): Stock price as a measure the value of the firm; \( \beta_0 \): The intercepts of equation; ACP: Average Collection Period; ITID: Inventory Turnover in Days; APP: Average Payment Period; CCC: Cash Conversion Cycle; CR: Current Ratio; DR: Debt Ratio; SIZE: Natural logarithm of Total Assets; FATA: Financial Assets to Total Assets; \( \varepsilon \): The error term
Regression analysis of the general model

\[ V_{it} = \beta_0 + \beta_1 (ACP_{it}) + \beta_2 (ITD_{it}) + \beta_3 (APP_{it}) + \beta_4 (CCC_{it}) + \beta_5 (CR_{it}) + \beta_6 (DR_{it}) + \beta_7 (SIZE_{it}) + \beta_8 (FATA_{it}) + \varepsilon \]

Table 4.3.1: Regression analysis of the general model

Coefficients (a)

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>T</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Beta</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>-62.918</td>
<td>89.132</td>
<td>-0.706</td>
</tr>
<tr>
<td></td>
<td>ITD</td>
<td>-0.145</td>
<td>0.141</td>
<td>-0.193</td>
</tr>
<tr>
<td></td>
<td>APP</td>
<td>0.112</td>
<td>0.155</td>
<td>0.127</td>
</tr>
<tr>
<td></td>
<td>ACP</td>
<td>-0.281</td>
<td>0.112</td>
<td>-0.326</td>
</tr>
<tr>
<td></td>
<td>CCC</td>
<td>-11.370</td>
<td>-0.508</td>
<td>0.614</td>
</tr>
<tr>
<td></td>
<td>DR</td>
<td>-25.903</td>
<td>28.759</td>
<td>-0.119</td>
</tr>
<tr>
<td></td>
<td>SIZE</td>
<td>11.613</td>
<td>6.539</td>
<td>0.271</td>
</tr>
<tr>
<td></td>
<td>CR</td>
<td>-2.046</td>
<td>13.283</td>
<td>-0.023</td>
</tr>
<tr>
<td></td>
<td>FATA</td>
<td>-137.038</td>
<td>117.237</td>
<td>-0.183</td>
</tr>
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</table>

a. Dependent Variable: VALUE

Model Summary

<table>
<thead>
<tr>
<th>Mode</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.502a</td>
<td>0.252</td>
<td>-0.140</td>
<td>50.6025</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), DR, SIZE, ITD, CR, ACP, APP, FATA, CCC
Source: Regression analysis between the dependent VALUE$_i$, independent (ACP, APP, CCC, ITD) and control (CR, SIZE, FATA, DR) variables using SPSS software for 22 Kenyan Non-financial firms, 2003-2009, 154 firms-year observations.

**Analysis of variance of Regression of the general model**

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>40515.36</td>
<td>7</td>
<td>5787.908</td>
<td>2.260</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>120348.77</td>
<td>47</td>
<td>2560.612</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>160864.12</td>
<td>54</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$a$ Predictors: (Constant), DR, SIZE, ITD, CR, ACP, APP, FATA, CCC

$b$ Dependent Variable: VALUE

Source: Regression analysis between the dependent, independent and control variables using SPSS software for 22 Kenyan Non-financial firms, 2003-2009, 154 firms-year observations.

The general regression equation established by taking all variables (ACP, APP, CCC, ITD, CR, SIZE, FATA, DR) constant at zero, the value of a firm will be -62.918. The data findings analyzed also show that taking all other independent variables at zero, a unit increase in ACP will lead to -0.281 decrease in the firm’s value, a unit increase in APP will lead to 0.112 increase in firm’s value, a unit increase in ITID will lead to a -0.145 decrease in value of a firm, a unit increase in CCC will lead to a -11.370 decrease in value of a firm.

A unit increase in SIZE will lead to a 11.613 increase in value of a firm, a unit increase in FATA will lead to a -137.038 decrease in value of the firm, while a unit increase in debt ratio will lead to a -25.903 decrease in value of a firm. The adjusted $R^2$ was 14% and the F statistics had a value of 2.260. There is therefore a negative relationship between ACP, ITD, CCC, FATA, DR and the value of the firm. On the other hand APP and SIZE has a
positive relationship with value of the firm. After these findings are subjected to the F-distribution test, the critical value is 2.21 which is less than the observed F statistic value of 2.260. Hence, there is a relationship between ACP, APP, CCC, ITD and the value of the firm.

**Table 4.3.2: Regression model for inventory turnover in days**

\[ V_{it} = \beta_0 + \beta_1 (ITD_{it}) + \beta_5 (CR_{it}) + \beta_6 (DR_{it}) + \beta_7 (SIZE_{it}) + \beta_8 (FATA_{it}) + \varepsilon \]

**Coefficients (a)**

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>T</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant) -85.021</td>
<td>57.945</td>
<td>-1.467</td>
<td>.147</td>
</tr>
<tr>
<td></td>
<td>ITD -.101</td>
<td>.107</td>
<td>-.137</td>
<td>-.941</td>
</tr>
<tr>
<td></td>
<td>DR -12.470</td>
<td>24.228</td>
<td>-.059</td>
<td>-.515</td>
</tr>
<tr>
<td></td>
<td>SIZE 12.436</td>
<td>4.258</td>
<td>.392</td>
<td>2.920</td>
</tr>
<tr>
<td></td>
<td>CR -4.474</td>
<td>2.432</td>
<td>-.219</td>
<td>-1.840</td>
</tr>
<tr>
<td></td>
<td>FATA -176.769</td>
<td>102.642</td>
<td>-.220</td>
<td>-1.722</td>
</tr>
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</table>

**Analysis of variance of the Regression model for inventory turnover in days**

**ANOVA (b)**

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression 41188.434</td>
<td>5</td>
<td>8237.687</td>
<td>3.41</td>
<td>.008</td>
</tr>
<tr>
<td></td>
<td>Residual 157019.809</td>
<td>65</td>
<td>2415.689</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total 198208.243</td>
<td>70</td>
<td>2826.739</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**a** Predictors: (Constant), ITD, CR, FATA, SIZE, DR
b Dependent Variable: VALUE

### Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.456*</td>
<td>.208</td>
<td>.147</td>
<td>.491497</td>
</tr>
</tbody>
</table>

a Predictors: (Constant), ITD, CR, FATA, SIZE, DR

Source: Regression analysis between the dependent VALUE, independent (ITD) and control (CR, FATA, SIZE, DR) variables using SPSS software for 22 Kenyan Non-financial firms, 2003-2009, 154 firms-year observations.

The coefficient of ITD is -.101 at α =5% indicating that there is significant negative relationship between ITD and the value of the firm. The current ratio which is a traditional measure of liquidity has also a significant negative relationship with the firm’s value which confirms that elements of liquidity and value of the firm have inverse relationship. This is relationship Perhaps is due to opportunity cost of holding high/less than optimal liquid assets. The debt ratio as a proxy for leverage; shows a significant negative relationship with the firm’s value, which means that when leverage of the firm increases it will cause a decrease in the value of the firm. The logarithm of total assets used as proxy for size of a company shows a significant positive relationship with the firm’s value which means that the bigger size firms have higher value compared to firms of smaller size. The ratio of financial assets to total asset has a significant negative relation with firm’s value.

The adjusted $R^2$ also called the coefficient of multiple determination is the percent of the variance in the dependent explained uniquely or jointly by the independent variables and is 14.7%. The Bo; y-intercept is -85.021 indicating that there are other determinants of value apart from ITD, CR, DR, FATA and SIZE. Overall; the model is significant as F-statistics is 3.41 which are greater than the critical value of F-distribution value of 2.21.
Table 4.3.3: Regression model for average payment period

Coefficients (a)

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>T</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>-67.828</td>
<td>54.786</td>
<td>-1.238</td>
</tr>
<tr>
<td></td>
<td>DR</td>
<td>-8.735</td>
<td>24.006</td>
<td>-.041</td>
</tr>
<tr>
<td></td>
<td>SIZE</td>
<td>10.703</td>
<td>3.801</td>
<td>.337</td>
</tr>
<tr>
<td></td>
<td>CR</td>
<td>-4.008</td>
<td>2.387</td>
<td>-.196</td>
</tr>
<tr>
<td></td>
<td>FATA</td>
<td>-221.314</td>
<td>91.338</td>
<td>-.276</td>
</tr>
<tr>
<td></td>
<td>APP</td>
<td>-0.02367</td>
<td>.066</td>
<td>-.042</td>
</tr>
</tbody>
</table>

a Dependent Variable: VALUE

Analysis of variance of the Regression model for average payment period
ANOVA (b)

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>39362.532</td>
<td>5</td>
<td>7872.506</td>
<td>3.22</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>158845.712</td>
<td>65</td>
<td>2443.780</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>198208.243</td>
<td>70</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a Predictors: (Constant), APP, CR, FATA, SIZE, DR

b Dependent Variable: VALUE

Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.446a</td>
<td>.199</td>
<td>.137</td>
<td>.494346</td>
</tr>
</tbody>
</table>

a Predictors: (Constant), APP, CR, FATA, SIZE, DR
Source: Regression analysis between the dependent VALUE, independent (APP) and control (CR, FATA, SIZE, DR) variables using SPSS software for 22 Kenyan Non-financial firms, 2003-2009, 154 firms-year observations.

The second regression is run using the average payment period as an independent variable the control variables. This gives the equation as follow:-

\[ V_{it} = \beta_0 + \beta_1 (APP_{it}) + \beta_5 (CR_{it}) + \beta_6 (DR_{it}) + \beta_7 (SIZE_{it}) + \beta_8 (FATA_{it}) + \varepsilon \]

The coefficient of APP is -0.02369 indicating that the coefficient of average payment period is negative and is significant at \( \alpha = 5\% \). It implies that the increase or decrease in the average payment period, significantly affects the value of the firm. The size of the firm has a positive impact on the value of the firm while other control variables like debt ratio, financial assets to total assets and current ratio has a negative relationship with the firm value. The adjusted \( R^2 \) is 13.7\%. The F-statistic has a value of 3.22 reflecting the significance of the model which is greater than F-distribution critical value of 2.21.

**Table 4.3.4: Regression model for average collection period in days**

<table>
<thead>
<tr>
<th>Coefficients (a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>1</td>
</tr>
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</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

a Dependent Variable: VALUE
Source: Regression analysis between the dependent VALUE, independent (ACP) and control (CR, FATA, SIZE, DR) variables using SPSS software for 22 Kenyan Non-financial firms, 2003-2009, 154 firms-year observations.

**Analysis of variance of the Regression model for average collection period in days**

### ANOVA (b)

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>60518.209</td>
<td>5</td>
<td>12103.642</td>
<td>5.71</td>
<td>.000*</td>
</tr>
<tr>
<td>Residual</td>
<td>137690.034</td>
<td>65</td>
<td>2118.308</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>198208.243</td>
<td>70</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Predictors: (Constant), ACP, CR, FATA, SIZE, DR
*Dependent Variable: VALUE

### Model Summary

<table>
<thead>
<tr>
<th>Mode</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.553*</td>
<td>.305</td>
<td>.252</td>
<td>46.0251</td>
</tr>
</tbody>
</table>

*Predictors: (Constant), ACP, CR, FATA, SIZE, DR

Source: Regression analysis between the dependent VALUE, independent (ACP) and control (CR, FATA, SIZE, DR) variables using SPSS software for 22 Kenyan Non-financial firms, 2003-2009, 154 firms-year observations.

The third regression is run using the average collection period in days (ACP) as an independent variable alongside the control variables. This gives the model as follows:

\[ V_{it} = \beta_0 + \beta_1 (ACP_{it}) + \beta_5 (CR_{it}) + \beta_6 (DR_{it}) + \beta_7 (SIZE_{it}) + \beta_8 (FATA_{it}) + \varepsilon \]

The coefficient of y-intercept Bo has a value of -59.391 meaning the value of the firm is affected by other variables besides the ones specified in the model. The coefficient of
average collection period in days is negative -0.302 and significant at $\alpha = 5\%$ and implies that increase or decrease in the cash collection period significantly affects the value of the firm. This indicates that if the trade debtors take less time to collect, it will increase the value of the firm. This is because of time value of money and opportunity cost. The adjusted $R^2$ is 25.2% and the F-statistic value of 5.714 which is greater than the critical value of F-distribution of 2.21.

**Table 4.3.5: Regression model for cash conversion cycle**

**Coefficients (a)**

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>T</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>-73.439</td>
<td>84.551</td>
<td>-.869</td>
</tr>
<tr>
<td></td>
<td>DR</td>
<td>-21.590</td>
<td>27.166</td>
<td>-.100</td>
</tr>
<tr>
<td></td>
<td>SIZE</td>
<td>11.164</td>
<td>5.694</td>
<td>.260</td>
</tr>
<tr>
<td></td>
<td>CR</td>
<td>-1.093</td>
<td>12.010</td>
<td>-.012</td>
</tr>
<tr>
<td></td>
<td>FATA</td>
<td>-110.966</td>
<td>106.230</td>
<td>-.148</td>
</tr>
<tr>
<td></td>
<td>CCC</td>
<td>-.217</td>
<td>.086</td>
<td>-.332</td>
</tr>
</tbody>
</table>

a Dependent Variable: VALUE

**Analysis of variance of the Regression model for Cash conversion cycle**

**ANOVA (b)**

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>38393.728</td>
<td>5</td>
<td>7678.746</td>
<td>3.072</td>
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<td></td>
<td>Residual</td>
<td>122470.392</td>
<td>49</td>
<td>2499.396</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>160864.120</td>
<td>54</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a Predictors: (Constant), CCC, CR, SIZE, FATA, DR
b Dependent Variable: VALUE

**Model Summary**

<table>
<thead>
<tr>
<th>Mode</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.489a</td>
<td>.239</td>
<td>.161</td>
<td>49.9940</td>
</tr>
</tbody>
</table>

a Predictors: (Constant), CCC, CR, SIZE, FATA, DR

Source: Regression analysis between the dependent VALUE, independent (CCC) and control (CR, SIZE, FATA, DR) variables using SPSS software for 22 Kenyan Non-financial firms, 2003-2009, 154 firms-year observations.

In the last regression model cash conversion cycle is used as an independent variable together with the control variables. It is the comprehensive measure of checking efficiency of working capital management. The model derived appears as follows:

\[
V_{it} = \beta_0 + \beta_1 (CCC_{it}) + \beta_5 (CR_{it}) + \beta_6 (DR_{it}) + \beta_7 (SIZE_{it}) + \beta_8 (FATA_{it}) + \epsilon
\]

The result here indicates that the coefficient of cash conversion cycle is -.217 and is significant at \( \alpha = 5\% \) and implies that the increase or decrease in cash conversion period will affect the value of the firm. Apart from the size the other control variables has a negative relationship with value of the firm. The adjusted \( R^2 \) is 16.7\%, the value of F-statistic observed is 3.072 which is greater than the critical value of F-distribution of 2.21 hence the model is significant.
CHAPTER FIVE
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1. INTRODUCTION
The chapter summarizes the findings of the analysis of the relationship between working capital management and value of the firm as reflected in the share prices. The chapter also draws conclusions and gives recommendations based on the findings. It highlights the limitations of the study and makes suggestions of further research in future.

5.2. SUMMARY OF FINDINGS AND DISCUSSIONS
The objective of this research was to find out the relationship between working capital management and value of the firms quoted on the NSE. In order to achieve this objective a causal relation was conducted where the stock price as the dependent variable for each of 22 sampled firms quoted at the Nairobi Stock Exchange were computed. The APP, ACP, ITD and CCC were computed as independent variables and as components of working capital management. Alongside the dependent and independent variables were also control variables such as current ratio, logarithm of total assets, financial assets to total assets ratio and debt ratio.

The choice of quoted companies was preferred because they represented the main sectors of the Kenyan economy, and are therefore considered as adequate representation of companies in Kenya. In addition, since they are publicly quoted and publish their annual reports, information about the measurement of working capital and value was readily available, unlike those unlisted companies.

A descriptive statistics analysis was conducted on all the variables to give the general behavior of the firms quoted at the Nairobi Stock Exchange with respect to working capital management and value. Pearson correlation coefficient analysis was also conducted to establish the relationship among the variables. The relationship between the dependent variable, value and the other variables was conducted using a general
regression model. To establish whether each of the independent variables had any significant relationship with the dependent variable (value) a regression model was conducted separately between the dependent variable and each of the independent variables alongside the control variables.

From the Pearson correlation coefficient analysis, the results showed some aspects of relationship among the variables. There was negative relationship between value and all working capital components apart from APP. The regression models indicated that there was some relationship between working capital management and the firm’s value. Both F-test and the coefficient determination of variance indicated this relationship where the adjusted R² was 14%. These findings helped in drawing the conclusion of the research.

5.3. CONCLUSION AND RECOMMENDATIONS
Following the findings in this study, a conclusion is drawn that there is a statistical relationship between efficient working capital management and the value of firms quoted in NSE. Hence, the alternative hypothesis; H₁ is accepted and the null hypothesis; H₀ is rejected. Analysis of the relationship between the value of the firm and individual components revealed a negative relationship with all working capital management components apart from APP. This indicate that the value of the firm can be enhanced by reducing average cash collection period, inventory turnover in days period, cash conversion period and delaying payments to the supplier.

The results of this study suggest that managers may increase value of their respective firms through efficient working capital management. This can be achieved by reducing the duration of cash conversion cycle to a reasonable minimum. The wealth of the firm’s shareholders could be enhanced as highlighted by Shin and Soenen (1998), Kithii (2008) and, Raheman and Nasr (2007) that efficient Working Capital Management is very important for creating value for the shareholders. A substantial amount of assets is held by Kenyan firms as working capital and thus the way working capital is managed is of great importance since they have a direct significant impact on the value of the firm.
Therefore, managers should strive to employ efficient working capital management in order to improve the performance of their firms by reducing the duration of cash conversion cycle.

5.4. LIMITATIONS OF THE STUDY

The analysis only covered the firms quoted at the Nairobi Stock Exchange and this may limit the fair findings that could have been found if the non quoted firms were covered.

The sample size included 22 quoted companies this could have affected the results and thus the findings should not be generalized with certainty.

The study focused on non financial firms only, financial firms were excluded from the sample hence the findings should not be generalized with certainty.

Only three control variables were considered in the model however there are other control variables such as growth which affects the value of the firm which were not included in the model.

Stock price was used to measure the value of the firm however; price is subject to other environmental factors different from working capital management hence the result should not be generalized with certainty.

The study covered a period of seven years this could have had some effects on the findings.

5.5. SUGGESTIONS FOR FURTHER RESEARCH

The study used stock price as the measure of value however, similar studies need to be done using other measures of firm’s value such net book value.

This studies need to be done in future to cover a wider sample size, longer period as well as companies not quoted at the Nairobi Stock Exchange.

The same study should be conducted for firms in financial sector such as banks and insurance companies which were excluded in this study.
There are other control variables which affects the value of the firms; however only three were considered in this study hence similar study should also be conducted including more control variables in the model.
REFERENCES


James,A.S (1951): Ten Great Economists from Marx to Keynes, New York: Oxford University Press.


Mwangi P.K., (2010), *The relationship between working capital management and the systematic risk of companies quoted at the NSE.* Unpublished MBA project, University of Nairobi.


## APPENDICES

### Appendix I: Presents Pearson correlation coefficients

<table>
<thead>
<tr>
<th></th>
<th>VALUE</th>
<th>ITD</th>
<th>APP</th>
<th>ACP</th>
<th>CCC</th>
<th>DR</th>
<th>SIZE</th>
<th>CR</th>
<th>FATA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>VALUE</strong> Pearson Correlation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>VALUE</td>
<td>1.000</td>
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* 5% level of significant ** 1% level of significant

Pearson correlation coefficients for all variables considered for 22 Kenyan firms, 2003-2009, 154 firms-year observations.
Appendix II: Companies listed on the Nairobi Stock Exchange as at 31st Dec. 2009

Main Investment Market Segment

Agriculture

1. Kakuzi Limited
2. Rea Vipingo Plantations Limited
3. Sasini Limited

Commercial & Services

4. Access Kenya Group Limited
5. Car & General Limited
6. CMC Holdings Limited
7. Hutchings Biemer Limited
8. Kenya Airways Limited
9. Marshalls (E.A.) Limited
10. Nation Media Group Limited
11. Safaricom Limited
12. Scangroup Limited
13. Standard Group Limited
14. TPS EA (Serena) Limited
15. Uchumi Supermarket Limited

Finance & Investment
16. Barclays Bank of Kenya Limited
17. Centrum Investment Limited
18. CFC Stanbic Holdings Limited
19. Diamond Trust Bank Limited
20. Equity Bank Limited
21. Housing Finance Limited
22. Jubilee Holdings Limited
23. Kenya Commercial Bank Limited
24. Kenya Re Corporation Limited
27. Olympia Capital Holdings Limited
28. Pan Africa Insurance Limited
29. Standard Chartered Bank Limited
30. Cooperative Bank of Kenya Limited

**Industrial & Allied**

31. Athi River Mining Limited
32. B.O.C Kenya Limited
33. Bamburi Cement Limited
34. BAT Kenya Limited
35. Carbacid Investments Limited
36. Crown Berger Limited
37. E.A. Cables Limited
38. E.A. Portland Limited
39. East African Breweries Limited
40. Eveready EA Limited
41. Kengen Limited
42. KenolKobil Limited
43. Kenya Power and Lighting co. Limited
44. Mumias Sugar Co Limited.
45. Sameer Africa Limited
46. Total Kenya Limited
47. Unga Group Limited

**Alternative Investment Market Segment**

48. A. Baumann & Co. Limited
49. Eaagads Limited
50. Express Kenya Limited
51. Williamson Tea Kenya Limited
52. Kapchorua Tea Co Limited
53. Kenya Orchards Limited
54. Limuru Tea Co. Limited

55. City Trust Limited
Appendix III: List of companies in the sample

1. Kapchorua Tea Co. Limited
2. Mumias sugar Limited
3. Sameer Africa Limited
4. East African Breweries Limited
5. E.A. Cables Limited
6. E.A. Portland Limited
7. Crown Berger Limited
8. BAT Kenya Limited
9. Athi River Mining Limited
10. Car & General limited
11. CMC Holdings Limited
12. Kenya Airways Limited
13. Marshalls (E.A.) Limited
14. Nation Media Group Limited
15. Standard Group Limited
16. TPS EA (Serena) Limited
17. Kakuzi Limited
18. Rea Vipingo Plantations Limited
19. Sasini Limited
20. Kenya Power and Lighting co. Limited
21. Williamson Tea Kenya Limited

22. Total Kenya Limited
Appendix IV: Data Collection form

Name of the Company

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