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

BY

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D61/70602/2008

A MANAGEMENT RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION OF UNIVERSITY OF NAIROBI

2010

DECLARATION

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

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Signed---------- Date----------

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

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DEDICATION

My heart felt dedication goes to my dear parents, father your hand drove fear out of me, triggered the urge to succeed. Mother, Wairimu wa Kang'ethe, a lady with a lion's heart, has been a great source of inspiration since my childhood. Anyone claiming to be educated, his/her mother comes first as the source of intelligence. My sincere dedication also goes to my dear wife, Margaret Wambui, my dear son Brian Kamande and lovely daughter Sylvia Wairimu, brothers and sisters, Pastor Peter Kamau and Rev. Moses Wangila 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 Almighty God for His presence, favour and being with me all through. The fear of God is the beginning of knowledge and wisdom. I am deeply indebted to my Supervisor, Mr. Herick O. Ondigo for his invaluable assistance and scholarly comments.

My special thanks to the Department of Finance and Accounting and all my colleagues for their assistance and moral support. Lastly, my heartfelt thanks go to the family of Mr. Masato Marukawa and Ms. Monicah Wangari for their encouragement and support during my preparations of this research.

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ABSTRACT

The issue of risk is of a great importance to any one interested in finance either as an investor or a finance manager. This is so because while the main objective of any investment is for its return, partly depends on the risk level associated with that investment. That is, the higher the risk the higher is the expected returns and vice versa. This being the case however, it has been established that investors can diversify away part of this risk. The part of risk which cannot be diversified away is systematic risk and this is what concerns the manager most.

A well designed and implemented working capital management is expected to contribute positively to the creation of shareholders' wealth. The purpose of this study was to determine the relationship between working capital management and firm's stock beta. The study used secondary data obtained from annual reports and 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 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 show that there is no a 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.

LIST OF ABBREVIATIONS

ANOVA	Analysis of variance
ACP	Average collection period
APP	Average payment period
ITD	Inventory turnover in days
CCC	Cash conversion cycle
CR	Current ratio
LOS	Logarithm of sales
FATA	Financial assets to total asset
DR	Debt ratio
NSE	Nairobi Stock Exchange
CAPM	Capital Asset Pricing Model
BI	Stock beta
ROA	Return on Assets
SPSS	Statistical Package for Social Science

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CHAPTER ONE

1.0. INTRODUCTION

1.1.0. BACKGROUND OF THE STUDY

1.1.1. Concept of Working Capital Management

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 and Wachomicz, 2000).

Once a product is sold, the proceeds are re-invested into the company to make further products and make more profits. When a product is produced and sold, ideally the cash against the sale should be received immediately. This does not happen in the real world because there is a time lag between the time that goods are sold and realizing profits. If a company waits until this money comes in for it to be re-invested and goods are produced again, the entire plant and machinery could be prone to lying idle for long durations. Thus, to ensure smooth operation through this time lag, each company earmarks a fund which is known as working capital for that business entity (Murali, 2000).

The ultimate objective of any firm is to maximize profit. But preserving liquidity of the firm is an important objective too. The problem is that increasing profit at the cost of liquidity can bring serious problems to the firm. Therefore, there must be a trade-off between these two objectives of the firm. If we do not care about profits we can not survive for a longer period. On the other hand, if we do not care about liquidity we may face the problem of insolvency or bankruptcy.

1.1.2. Working capital management components

Current assets consist of cash in hand, cash in bank and cash in transit, short-term investment (quoted shares of other companies intended for sales), inventories (raw materials, work in progress, finished goods) trade receivables and bills receivables and loans and advances given by the company to others. Current liabilities on the other hand consist of trade payables and bills payables, trade advances (received by the company for supply of goods and services), short term loans from other sources and provisions for payments of taxes, bad debts to be written off and adverse fluctuations of exchange rates. It should be noted that, delaying payments to suppliers allows the firm to assess the quality of the products bought and can be an inexpensive and flexible source of financing for the firm. On the other hand, late payment of invoices can be very expensive if the firm is offered discount for early payment (Murali, 2000).

Therefore, working capital management involves the relationship between a firm's short term assets and its short term liabilities. The goals of working capital management are to enable the firm continue its operations and that it has sufficient ability to satisfy maturity, short term debts and upcoming operational expenses (Murali, 2000).

A popular measure of working capital management is the cash conversion cycle, that is, the true lag between the expenditure for the purchases of raw materials and the collection of sales for finished products. It is observed that, the longer the lag, the larger the investment in working capital (Deloof, 2003). 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 cost of higher investment in working capital rises higher than the benefits of holding more investments and/or granting more trade credit to customers.

Efficient working capital management involves planning and controlling current assets and current liabilities in a manner that eliminates the risk of inability to meet due short term obligations on one hand and avoid excessive investment in these assets on the other hand (Eljelly, 2004). In practice, working capital management has become one of the

most important issues in organizations where many financial executives strive to identify the basic working capital drivers and the appropriate level of working capital (Lamberson, 1995). Companies can minimize risk and improve the overall performance by understanding the role and drivers of working capital. An optimal level of working capital would be the one in which a balance is achieved between risk and efficiency. It requires continuous monitoring to maintain proper level in various components of working capital; trade receivables, inventory and trade payables etc (Lamberson, 1995).

1.1.3. Concept of systematic risk

The definition of investment risk has led to the observation that not every one agrees on how to define risk, let alone measure it. Risk has been simply defined as the likelihood of the realized returns on an investment being different from the expected return (Modigliani and Pogne, 1974). The risk of an individual security can be divided into two components, the systematic risk and the unsystematic risk components. The unsystematic risk component can be eliminated by mixing the uncorrelated securities in a diversified portfolio, while systematic risk cannot be eliminated through diversification. The systematic risk results from the fact that the returns on nearly every security depends to some degree on the overall performance of the market. It is this systematic risk portion which gives rise to the risk premium that is attached to a security. The unsystematic risk requires no such premium, since it can be eliminated through diversification.

According to portfolio theory by Markowitz of 1952, in a situation where the risk and return of various assets have been ascertained, it is expected that a rational investor will choose that combination of assets that will maximize his returns while minimizing risks to bear (Reilly and Brown, 2000). In effects therefore, the investors and other market players will want to know or estimate the risk associated with the returns of a particular asset. In capturing this risk, knowledgeable market players who include analysts and investors will use a statistical measure called beta. Beta is a measure of systematic risk of a security. The return on a security will depend on the return of the market as a whole. There are factors which affect the market that include inflation rate in the economy, the interest rate,

legal/ political factors and others. These factors existing in the market may have more profound effects on the returns on a security much more than the market as a whole. Thus, it is commonly necessary to measure the volatility of individual stock; beta that measures the variation in the returns of a portfolio to the variation in return of entire market. This helps them isolate investment opportunities that have favourable risk-return characteristics and hence select stocks for inclusion in their portfolio.

1.1.4. The relationship between Working Capital Management Practices and Systematic Risk of a Stock.

The return of any stock is influenced by both systematic and unsystematic risks. The systematic risk is the risk that is associated with the external factors such as interest rates, inflation, exchange rates, business cycles, political events, financial crisis and others and cannot be diversified using uncorrelated assets in a portfolio. On the other hand unsystematic risk or firm's specific risk is the risk that the manager of the firm can strive to manage by diversification of a portfolio with different classes of assets. Thus, every firm manager strives to manage any risk that may affect shareholder's value. He/ she will be very much interested with any strategy that he/she may use to minimize the risk under consideration (Reilly and Brown, 2000).

It is believed that different accounting data, Working Capital Management being one of them, may have information content about the magnitude of the systematic risk of a common stock. It is with this belief that considerable research has been done by the academic and investment communities on the estimation of beta. The ability to relate working capital management and equity risk has a value for explaining and predicting market betas and therefore helping in portfolio management. The focus in this area has also been because it has implications for teaching and research in finance. It also helps business managers to better assess the relevance and bearing of their particular corporation decisions on the resultant risk borne by the firms. Evidences have shown that financial ratios / profitability ratio and to some extent activity ratios are important determinants of the systematic risk of a common stock (Loo and Ramasamy, 1989). Beaver et. al., (1970) show that a significant correlation exists between the dividend

payout, growth, leverage, liquidity, asset size, variability in earnings and covariability in earnings ratios with the systematic risk.

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). Belkaoui (1978) and Dhingra (1982) provide the Canadian evidence. Significant positive relationships were found between the current and the long-term to common equity ratio and systematic risk, liquidity (current ratio) was found to be directly related to the systematic risk. The general expectation is that the systematic risk of the common stock is related directly to financial leverage and inversely to liquidity and activity ratios (Loo and Ramasamy, 1989). The findings of Carpenter and Johnson (1983) were that there is no relationship between the level of current assets and risk of the firms.

1.2. STATEMENT OF THE PROBLEM

Investors are assumed to be rational and risk–averse and thus the financial economics researchers should find out whether working capital management relates with the beta (Loo and Ramasamy, 1989). In investment analysis, the risk-return relationship is of paramount importance in portfolio selection. This is so because while investors expect a particular return on their investment, there is always the likelihood that the realized return may be different from the expected return. This risk-return relationship is clearly demonstrated in the capital asset pricing model (CAPM) where the risk associated with the security is determined, (Sharpe, 1964).

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, 1973). According to Deloof (2003) the way working capital is managed has a significant impact on profitability and risk of firms. This implies that there is a certain level of working capital requirement which potentially maximizes returns.

The return on a security will depend on the return of the market as a whole. There are factors which affect the market that include inflation rate in the economy, the interest rate, legal/ political factors and others. These factors existing in the market may have more profound effects on the returns on a security much more than the market as a whole. It is commonly necessary to measure volatility of individual stock; beta that measures the variation in the returns of a portfolio to the variation in return of entire market. This helps to isolate investment opportunities that have favourable risk-return characteristics and hence select stocks for inclusion in their portfolio (Sharpe, 1964).

Loo and Ramasamy (1989) in their study, Accounting variables as determinants of systematic risk in Malaysian common stock, indicates that accounting ratios, have influence on a systematic risk. (Beaver et. al, 1970) shows that a significant correlation exists between the dividend payout, growth, leverage, liquidity, asset size, variability of earnings and covariability in earnings in ratios with the market beta. However, in Kenya the only study close to this but not in relation to working capital management was by Lutomia (2002) on the relationship between capital structure and systematic risk of the stocks of companies listed on the Nairobi Stock Exchange. The findings were that there is no relationship between capital structure and systematic risk of the stock.

Thus, as the working capital can be used by the managers to achieve an optimal level for trading-off between risk and returns, the problem statement can then go as; is there a significant relationship between efficient working capital management and the firm's stock beta? That is, can efficient working capital management affect the size of a firm's stock beta of the companies quoted at the Nairobi Stock Exchange?

1.3. OBJECTIVE OF THE STUDY

To establish whether there is a relationship between working capital management and systematic risk of stocks of the companies quoted at the Nairobi Stock Exchange.

1.4 . IMPORTANCE OF THE STUDY

The knowledge from this study is considered to be important 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 systematic risk of their common stock 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 systematic risk of the stock is important input into investment analysis and portfolio construction**.**

Academicians

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 systematic risk of the stock. The knowledge can enable the government's economic planners formulate policies that promote sound business environment especially during economic instability times.

CHAPTER TWO

2.0. LITERATURE REVIEW

2.1. INTRODUCTION

This chapter is about literature review on working capital management and systematic risk. It 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 historical developments of Capital Asset Pricing Model, the empirical tests on the relationship between Systematic risk and Working capital management and the conclusion of the literature review.

2.2. ORIGIN OF WORKING CAPITAL MANAGEMENT

Many surveys have indicted 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.

2.3.0. THEORIES OF WORKING CAPITAL MANAGEMENT

2.3.1. 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.

2.3.2. 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, favourable 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.

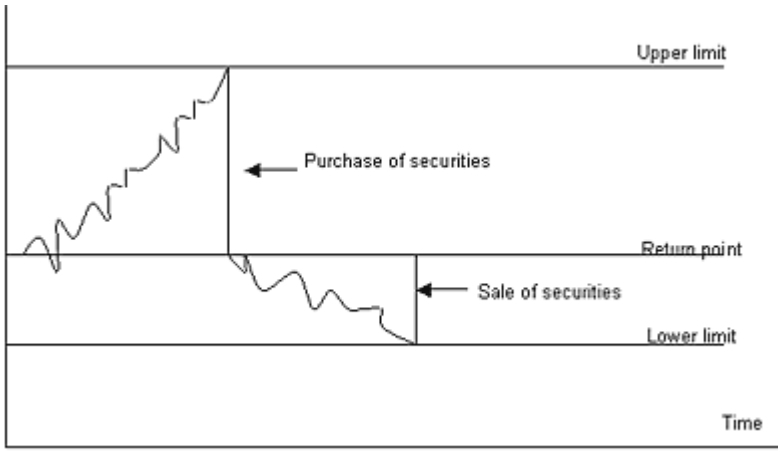
2.3.4. The Modern Quantity Theory

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:

Figure 2.3 1: Miller and Orr's Cash Management Model



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.

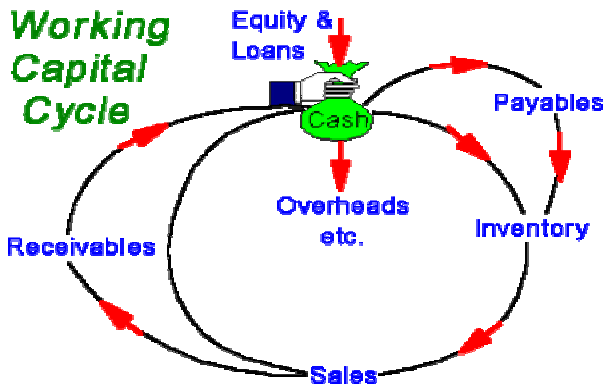
2.3.7. Operating cycle theory

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 non current 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



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.

2.4.0. THE CAPITAL ASSET PRICING MODEL

2.4.1. Historical Developments of Capital Asset Pricing Model

The capital asset pricing model was the work of a financial economist (and later, Nobel Laureate in economics) Sharpe (1964), as set out in his book "Portfolio Theory and Capital Markets'. CAPM extended from Markowitz's portfolio theory of 1952 to introduce the notions of systematic and specific risk. CAPM considers a simplified world where all investors aim to maximize economic utility, are rational and risk-averse, are price takers, that is; they cannot influence prices; can lend and borrow unlimited under the risk free rate of interest trade without transaction or taxation costs; deal with securities that are all highly divisible into small parcels; have identical investment horizons; have identical options about expected returns, volatilities and correlations of available investments and assume all information is at the same time available to all investors.

CAPM starts with the idea that individual investments contain two types of risks. First, systematic risk is the risk of holding the market portfolio. These are market risks that cannot be diversified away. As the market moves, each individual asset is more or less affected. To the extent that any asset participates in such general market moves, that asset entails market risk. Interest rates, recessions and wars are examples of systematic risks. Secondly, specific risk (unsystematic risk) is the risk which is unique to an individual's asset. This risk can be diversified away as the investor increases the number of uncorrelated stocks in his or her portfolio. In more technical terms, it represents the component of an asset's returns which is uncorrelated with general market moves.

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

2.4.2. The CAPM Model

Sharpe found that the return on an individual stock, or a portfolio of stocks, should equal to the cost of capital. The standard formula remains the CAPM, which describes the relationship between risk and expected return.

The model has the form;

$$E(R_i) = R_f + ß_i [E(Rm) - R_f]$$

Where; E (Ri) is the expected return on security i, Rf is the risk –free rate of interest such as risk interest arising from government bonds., ßi the beta coefficient is the sensitivity of the expected asset returns to the expected market returns, and $[E(Rm) - R_f]$

= Market risk premium

CAPM's starting point is the risk-free rate- typically a 10 year government bond yield. To this is added a premium that equity investors demand to compensate them for extra risk that they accept. This equity market premium consists of the expected return from the market as a whole less the risk –free rate of return. The equity risk premium is multiplied by a coefficient that Sharpe called "beta".

2.4.3. Measurement of systematic risk – The Beta

According to CAPM, beta is the only relevant measure of a stock's risk (systematic risk). It measures a stock's volatility, that is; it shows how much the price of a particular stock

jumps up and down compared with how much the stock market as a whole jumps up and down.

Beta has the following characteristic; Beta is unit less, the beta co-efficient of the market portfolio is equal to one and the beta coefficient of any security can take any of the three critical values;

$\underline{ßj > 1 \quad (ßj > ß_m)}$

This means that returns of security j have a higher sensitivity than the market portfolio. Such portfolios are referred to as being aggressive.

$\underline{ßj < 1 \quad (ßj < ß_m)}$

This indicates that the security j has a lower systematic risk than that of the market. Such portfolio or assets are described as defensive.

$\underline{ßj < 0}$

This means that security j is not sensitive to any security in the market.

$\underline{ßj = 1}$

This indicates that the security j has a systematic risk equal that of the market.

To determine the beta coefficient of a security, the following model of return-generating process showing linear relationship between the rate of return on security I, Rit, and the market return, Rmt, for a period t is used. This is the market model from the popular Capital Asset Pricing Model;

$$Rit = \alpha i + \beta i Rmt + \varepsilon it$$

Where εit residuals during the period t such that E (εit) = 0, and variance of $\varepsilon it = \partial^2 i$ and cov. (εit, εjt) = 0, cov. (εit, Rmt) = 0. The estimate of the systematic risk βi is computed as follows;

$$\beta i = \frac{[\sum (Rit - \overline{R}it)(Rmt - \overline{R}m)]}{n}$$

$$[\sum (Rmt - \overline{R}m)^2]$$

t-1

Where $\overline{R}i$ is the mean of Rit *and* $\overline{R}m$ is the mean of Rmt. Hence,

$$ßi = \frac{COV\ (Ri, Rm)}{Var\ (Rm)}$$

2.5. EMPIRICAL TESTS ON SYSTEMATIC RISK AND WORKING CAPITAL MANAGEMENT

The study of individual firm's risk as related to their underlying characteristics began with the work of (Beaver and et. al, 1970). They examined the relationship of certain accounting ratios (dividend payout, liquidity, earnings variability, leverage, asset size and covariability of earnings) to firm's systematic risk and found a strong and significant association between them.

Bowman (1980) attempted to establish whether there was a relationship between systematic risk and financial accounting variable. He looked into earnings variability, dividend payout, capital structure and growth. He collected market values for both debt and equity for a sample of 92 firms. He concluded that systematic risk was not a function of earnings variability, growth, size of a firm, or dividend payout. However, there was a theoretical relationship between systematic risk and the firm's leverage.

Shin and Soenen (1998) 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. The relationship between the length of Net Trading Cycle, corporate profitability and risk adjusted stock return was examined using correlation and regression analysis, by industry and capital intensity. They found 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.

Belkaoui (1978) and Dhingra (1982) provide the Canadian evidence. Significant positive relationships were found between the current and the long–term debt to common equity ratios and systematic risk. Liquidity (current) was found to be directly related to the systematic risk.

Loo and Ramasamy (1989) in their study on the relationship between financial accounting variables and systematic securities risk in a small and developing capital market namely; Kuala Lumpur Stock Exchange based on 67 firms between the years 1977 and 1984 shows that there is the influence of accounting ratios on the systematic risk. However, the results show a negative relationship between leverage ratio and risk. Factor analysis was used to group and identify the financial variables into independent dimensions. The beta of an individual stock was estimated by regressing a time series of the historical data from the Kuala Lumpur Stock Exchange composite index which is non-dividend adjusted value-weighted sample index monthly returns from 1977-1984 were used to compute monthly betas of the individual firms. The total period was later sub-divided into two four-year periods of 1977 to 1980 and 1981 to 1984. Betas were computed for each period for the individual firms. The betas of firms for these different periods were then tested for their stability. All companies established before 1977 and listed on the Kuala Lumpur Stock Exchange continuously over the test period were included in the initial sample. All companies which had not been traded continuously were discarded if the price quotations for any period of four months were missing. For each of the selected securities monthly closing prices were obtained and adjusted for bonuses and rights. Using the adjusted

prices, monthly returns were computed for the firm's security. The study used ratios which have the characteristics of being commonly used and understood by the general investment community and widely used in previous in research on risk analysis. The variables used are presumed to reflect the results of the main corporate decisions mostly likely to be associated with the systematic risk of the firm. The problem of possible bias due to multicollinearity between any two accounting series was mitigated by selecting one representation variable from each financial profile of a firm after identifying the factors in the analysis. To assist the selection of the representative variable from each financial dimension factor analysis was used to group and identify the financial data into independent dimensions.

Smith and Begemann (1997) emphasized that those who promoted working capital theory showed that profitability and liquidity comprised that salient goods of working capital management. The problem arose because the maximization of the firm's returns could seriously threaten its liquidity and the pursuit of liquidity had a tendency to dilute returns. This article evaluated the association between traditional and alternative working capital measures and returns on investment (ROA) specifically in industrial firms listed on the Johannesburg Stock Exchange. The problem under investigation was to establish whether the more recently developed alternative working capital concepts improved association with return on investment to that of traditional working capital ratios or not. Results indicated that there were no significant differences amongst the years with respect to the independent variables. The results of their stepwise regression corroborated that total current liabilities divided by funds flows accounted for most of the variability in returns or investment (ROA). The statistical test results showed that a traditional working capital leverage ratio, current asset, current liabilities divided by funds flow, displayed the greatest associations with returns on investment. Well known liquidity concepts such as the current and quick ratios registered insignificant associations whilst only one of the newest working capital concepts the liquidity comprehensive index, indicated significant associations with returns on investment.

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.

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.

However, there was a need to establish how firms' stocks specifically responded to working capital management practices subject to the effects of the external environmental factors to the firms quoted at the Nairobi Stock Exchange. This calls for the measure of stock's beta or systematic risk in relation to working capital management. Thus, a study on the relationship between working capital management practices and systematic risk of stock needs be carried out.

Nyakundi (2003) studied the working capital management policies among public companies in Kenya, while Lutomia (2002), carried out a study close to this, on the relationship between capital structure and systematic risk of the stocks of companies listed on the Nairobi Stock Exchange. The findings of the study by Lutomia were that there is no relationship between capital structure and systematic risk of the stock.

In her study 2001 entitled, 'business risk and systematic: a case of companies listed at the Nairobi stock exchange" Ndegwa (2001) found out that the relationship between business risk and market risk holds for selected companies and not all companies. For the market as a whole the study revealed that there is a relation between systematic risk and business risk. Also the study revealed that only a small number (30%) of companies with high risk are compensated with a high return. The study used secondary data covering years 1996 to 2000 derived from the financial statements of the selected companies. Regression

method was used to analyze the data. On the other hand, Ngaba (1990) studied the working capital management practices used in the Kenya secondary schools.

2.6. CONCLUSION

In order to develop the framework for this study, relevant literature were established mostly in the developed countries was relied on. It is believed that the experiences in the developed countries can be used as a reference point for the managers in developing countries like Kenya. Although the study by Loo and Ramasamy (1989) on the relationship between financial accounting variables and systematic securities risk in a small and developing capital market namely; Kuala Lumpur Stock Exchange shows that there is the influence of accounting ratios on the systematic risk, no similar study has been carried out here in Kenya. The study close to this, was carried out by Lutomia (2002), on the relationship between capital structure and systematic risk of the stocks of the companies listed on the Nairobi Stocks Exchange that showed that there is no relationship between capital structure and systematic risk of the stock. Amid these positions therefore this research would like to find out whether the relationship tested on firms quoted at Kuala Lumpur Stock Exchange hold on the Nairobi Stock Exchange. The conceptual approach presented in the literature review helps in defining the approach to common working capital management components and the beta concept. This helps in designing the data collection approach and the analysis the sample developed to establish the relationship. In conclusion, this study therefore seeks to establish the effects of a firm's working capital management practices on the systematic risk of common stocks in an effort to analyze the relationship between systematic risk and working capital management practices on the Nairobi Stock Exchange. It hopes to bring new knowledge and hence a better understanding of our stock market.

CHAPTER THREE

3.0. 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 were 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 the systematic risk of its common stock in Kenya. This is causal relationship study between working capital management and its effects on systematic risk of the firms listed on the Nairobi Stock Exchange was to be established for a period between 2003 and 2009, thus covering a period of seven years. This section of the study discusses the firms based on the selected common variables of working capital and the variables used to compute the stock beta as included in the distribution patterns of data. It also applies statistical techniques such as descriptive and quantitative analysis in establishing the relationship between working capital management and systematic risk of the firm's stock.

3.3. THE POPULATION

The population of interest in this study constituted all companies quoted at the Nairobi for the period of 7 years between from 2003 and 2009. There were then 55 firms quoted at the Nairobi Stock Exchange both main investment market segment and the alternative investment market segment.

3.4. THE SAMPLE SIZE AND SAMPLING PROCEDURES

A sample is defined as a small proportion of the population selected for observation and analysis (Best and Khan, 1993). They further said that, each case in the sample is referred to as a 'respondent'. The study was based on financial statements of the selected firms listed on the Nairobi Stock Exchange. 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. In order to come up with the sample, firms were to be in their business for the whole study period. Neither of the firms was to be de-listed by the Nairobi Stock Exchange nor was to be merged with any other firm during the whole window period. The merged and de-listing from the Nairobi Stock Exchange, due to any reason/restriction imposed by the regulators, made the firm ineligible to be included in the study. New incumbents in the market during the study period were not included in the sample. Furthermore firms must were to have complete data for the period 2003-2009 which reduced the final sample to 22 non-financial firms (see appendix III).

3.5. DATA COLLECTION PROCEDURES

The data used in this study is secondary data that was obtained from Nairobi Stock Exchange Handbook. A data collection form was 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, common stock dividend, interest expenses, annual corporation tax, firm's earnings and common stock issued. This was from Annual Capitalization Reports and Annual Price Lists for the period of seven years covered under this study. This was aimed at coming up with valid empirical evidence to the issues of the relationship between working capital management and systematic risk.

The variables

The research was aimed at analyzing the relationship between Working Capital Management and systematic risk for firm quoted at the Nairobi Stock Exchange. The data collection procedure was achieved by developing a similar framework used by Loo and Ramasamy (1989), Shin and Soenen (1998), Deloof (2003), Lazaridis and Tryfonidis (2006) and Kithii (2008) along side one applied by (Lutomia, 2002). The following data was used to come up with the required variables; The stock prices at the beginning and end each year; Total amount of interest earning debt outstanding, the corresponding annual interest payment each year and the total number of shares in issue; Total annual ordinary dividends per share and gross dividend paid; The annual corporate tax for each

year; Return on the firm's stock; Firm's earnings; Trade receivables; Trade payables; Inventories; Current assets; Current liabilities; Interest expenses; Total sales; Total cost of sales; Financial assets; Non-current assets; Equity; Long term debt; They include dependent, independent and control variables.

Dependent Variable

The stock beta of which the method of its measure is demonstrated by Loo and Ramasamy (1989), Lutomia (2002) is a measure of systematic risk and was hereby used as dependent variable.

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 were used as independent variables.

Control Variables

The size natural logarithm of sales (LOS), 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 were 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 were included as control variables in the regression.

3.6.0. DATA ANALYSIS TECHINIQUES

To determine the relationship between working capital management and systematic risk of companies listed on the Nairobi Stock Exchange, two types of data analysis were used; descriptive and quantitative analysis.

3.6.1. Descriptive Analysis

Description analysis is 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 were used to describe the different variables of interest in the study. Researches have already been conducted in some areas of this study and a lot of information was already in hand, and 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 was correlation models specifically Pearson correlation to measure the degree of association between different variables under consideration. The other method used was multiple regression analysis that estimated the causal relationships between stock beta and other chosen variables. Generalized Least Squares (Cross section weights) method is applied for analysis. The use of panel data in a pooled regression where time-series and cross-sectional observations were combined and estimated. This meant that, several cross-sectional units were to be 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 systematic risk. If efficient working capital management reduces stock beta, one expected a positive relationship between the measures of working capital management and systematic risk variable.

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. In other words, several cross-sectional units were observed over a period of time in a panel data setting. 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 stock beta. The determinants of corporate stock beta were estimated using pooled least squares and general least squares method with cross section weights.

3.6.5. Determinants of the beta

The assumption of the validity of the MM theory approach by Modigliani and Miller (1958) was applied in this case. Hence, to discuss this approach specifically a consideration was made on the relationship for the shilling return to the common shareholder from the period t-1 to t. Lutomia (2002) in his study found that the beta stock is not related to the firm capital structure. Thus, whether the firm was leveraged or not would not affect the stock beta. Hence, to measure the firm's stock beta, the equations used by Hamada (1972) and Lutomia (2002) were applied as follows:

$C_t = (x\text{-}1)\ t\ (1\text{-}T)\ t - P_t + \Delta G_t = D_t + Cg_t$

Where, C_t= Total shilling return to the common shareholder from period t-1 to t, X_t= Earnings before interest and preferred dividends, I = Interest expense, T= Corporate tax rate, P_t= Prefered dividends paid, ΔG_t= The change in capitalized growth over the period, D_t=Common stock dividends, Cg_t= Common stock capital gains.

Its should be noted that there was the need to add any change in capitalized growth since the study was trying to explain the common shareholder's market holding period shilling return with respect to systematic risk, Δgt must be added for firm's growth to the current period's profits from existing assets since capitalized growth opportunities of the firm future earnings from new assets over and above firm's cost of capital which are already reflected in the stock price at time, (t-1) should change over the period and would accrue to the common shareholder.

Thus, the above variables were used in the model below to give the systematic risk of a common stock:

$$\beta i = \frac{Cor(Rit, Rmt)}{\sigma 2\,(Rmt)}$$

Where, R_{it}= The common shareholder rate of return, R_{mt} = The return on the market portfolio.

3.6.6. 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 beta. To achieve this, the study made the testable hypothesis (the null hypothesis Ho: verses the alternative hypothesis H1) as follows:

H_o: There is no relationship between efficient working capital management and systematic risk of Kenyan firms.

H_1: There is a possible positive relationship between efficient working capital management and systematic risk of Kenya firms. That is, firms more efficient in managing their working capital were expected to report low level of stock beta.

3.6.7. 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:

$$B_{it} = \beta_o + \sum_{i=1}^{n} \beta_i X_{it} + \varepsilon, \text{ where:}$$

B_{it} : Stock beta of firm at time t; i=1,2, ……., 55 firms

β_o: The intercepts of equation

β_i : Coefficients of X_{it} variables

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

t : Time = 1,2, ……, 7 years.

ε: The error term

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

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

Where:

B_i: Stock beta of the firm; β_o: 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; LOS: Natural logarithm of Sales; FATA: Financial Assets to Total Sales; ε: The error term

The hypothesis is to be tested at 5% level of significance using F-test.

CHAPTER FOUR

4.0. DATA ANALYSIS AND FINDINGS

4.1. INTRODUCTION

This chapter discusses the interpretation and presentation of the findings. The objective of this study was to establish whether there is a relationship between working capital management and systematic risk of stocks of the companies quoted at the Nairobi Stock Exchange. This chapter focused on data analysis, interpretation and presentation. 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

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
BI	154	-.84	5.90	.0949	.62659
ACP	154	9.00	163.00	70.3961	32.12382
APP	154	11.00	607.00	120.7532	94.19645
ITD	154	8.00	601.00	113.6234	92.12950
CCC	154	-206.00	689.00	62.9286	99.26811
CR	154	.50	18.12	1.9310	1.84959
LOS	154	12.93	18.09	15.1790	1.32934
FATA	154	.00	1.00	.1601	.16426
DR	154	.00	.66	.1322	.14005

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 63 days and standard deviation is 99 days. Firms receive payment after sales after an average of 70 days and a standard deviation of 32 days. Minimum time taken by a company to collect cash from receivable is 9 days while the maximum time for this purpose is 163 days. It takes an average 114 days to sell inventory with standard deviation of 92 days. Maximum time taken by a company is 601 days which is a very large time period to convert inventory into sales while the minimum is 8 days. Firms wait an average of 121 days to pay their purchases with a standard deviation of 94 days.

To check the size of the firm and its relationship with stock beta, natural logarithm of sales is used as a control variable. The mean log of sales is 15.18 while the standard deviation is 1.33. The maximum value of the log of sales of a company in a year is 18.09 and the minimum is 12.93.

In the same way to check the liquidity of the companies, a traditional measure of liquidity (current ratio) is used. The average current ratio for firms analyzed is 1.93 and a standard deviation of 1.84. The highest current ratio for a company in a particular year is 18.12 times in the same way the minimum ratio for a company in a year is 0.5.

To determine the debt financing and its relationship with the stock beta the debt ratio (obtained by dividing the total debt of the company by the total assets) is used as control variable. From the results the average debt ratio for the analyzed companies was 13.2% with a standard deviation of 14%. The maximum debt financing used by a company is 66% while the minimum level of the debt ratio is 0%.

To determine the ratio of the fixed financial assets to total assets of the analyzed firms, the financial assets to total assets ratio is used as controlled variable. The mean value for this ratio is 16% with a standard deviation of 16%. The maximum portion of the assets in the form of financial assets for a particular company is 100% and the minimum is 0%.

4.3.0. 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

If efficient working capital management decreases stock beta, one should expect a negative relationship between the measure of the working capital management and the stock beta. There is a negative relationship between stock beta on 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 reduces the stock beta.

Appendix I: Presents Pearson correlation coefficients for all variables considered

The analysis of correlation results between the average collection period and stock beta show a negative coefficient -0.018, with p-value of 0.820. It indicates that the result is significant at α =5%, and that if the average collection period increases it will have a negative impact on the stock beta and the stock beta will increase. The correlation results between inventory turnover in days and the stock beta also indicates the same type of result where the correlation coefficient is -0.092 and a p-value of 0.258 which significant at α = 5%. It also indicates that if the firm takes more time in selling inventory it will increase its stock beta. The correlation result of average payment period also shows the coefficient is negative and significant α = 5%. It was also realized that there is a negative correlation -0.064, with p value of 0.427 between average payment periods and the beta stock of a firm. From these results we can deduce that an increase in average payment

period will have a negative impact on the stock beta of the firm, will lead to decrease in stock beta of the firm. The cash conversion cycle which is a comprehensive measure of working capital management also has a negative coefficient -0.029 and the p-value is 0.717 and significant at $\alpha = 5\%$. It means that if the firm is able to reduce the cash conversion cycle it can reduce its stock beta.

By analyzing the results a conclusion can be drawn that if the firm is able to reduce these time periods, then the firm is efficient in managing working capital. This efficiency will lead to decreasing the size of the stock beat. Current ratio as a traditional measure of checking liquidity of the firm has a significant negative relationship with the stock beta. It coefficient is -0.055 and a p-value of 0.497 and significant at $\alpha = 5\%$. It indicates that the elements of liquidity and stock risk have inverse relationships. So, the Kenyan firms need to maintain an optimal level between the two measures.

The positive significant association that exists between stock beta and measure of firm size, LOS has a coefficient of 0.051 with a p-value of 0.533 and is significant at $\alpha = 5\%$. It shows that as the size of the firm increases, it will decrease the stock beta. It was also revealed that there is a negative relationship between financial assets to total assets of a firm and its stock beta. This was shown by a correlation of -0.050 and p value of 0.538. This indicates that an increase in financial assets to total assets of a firm will lead to a negative impact on stock beta of a firm.

The significant relationship between the average collection period and cash conversion cycle, with a correlation coefficient is 0.333 and a p-value of 0.000 is significant at $\alpha = 1\%$ which means that if a firm takes more time to collect cash against the credit sales it will increase it cash conversion cycle.

There is also a positive relationship between inventory turnover in days and the cash conversion cycle which means that if the firm takes more time to sell inventory it will lead to increase in the cash conversion cycle as well. The correlation coefficient is

positive and is 0.531, with a p-value of 0.000 showing that it is highly significant at α = 1%.

The average payment period and cash conversion cycle have a negative relationship with a coefficient of -0.420 and a p-value 0.000 and highly significant at α = 1%. It means that if firms take more time to pay their purchases than the time for collection and selling inventory, the cash conversion cycle will be reduced.

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

4.3.2. Regression analysis

The researcher conducted a multiple linear regression analysis so as to determine the relationship between the stock beta of the firm and the 8 independent variables; ITID: Inventory Turnover in Days'; Average Payment Period; Cash Conversion Cycle; Current Ratio; Debt Ratio; Natural logarithm of Sales; Financial Assets to Total Sales; The error term for 7 years. The regression equation is

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

Where: B_i: Stock beta of the firm; β_o: 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; LOS: Natural logarithm of Sales; FATA: Financial Assets to Total Sales; ε: The error term

Regression analysis of the general model

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

Table 4.3.1: Regression analysis of the general model

Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.212	.706		-.300	.764
	ACP	-.001	.018	-.048	-.052	.959
	APP	.001	.018	.191	.069	.945
	ITD	-.002	.018	-.315	-.117	.907
	CCC	.002	.018	.243	.084	.933
	CR	-.018	.029	-.053	-.609	.543
	LOS	.028	.043	.060	.656	.513
	FATA	-.638	.827	-.167	-.772	.442
	DR	.550	.986	.123	.558	.578

a Dependent Variable: B_I

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.147(a)	.022	-.032	.63663

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

Source: Regression analysis between the dependent B_I, independent (ACP, APP, CCC, ITD) and control (CR, LOS, 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

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.302	8	.163	.401	.918(a)
	Residual	58.768	145	.405		
	Total	60.070	153			

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

b Dependent Variable: B_I

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.

According to the regression equation established, taking all variables (ACP, APP, CCC, ITD, CR, LOS, FATA, DR) constant at zero, the stock beta of a firm will be – 0.212. The data findings analyzed also show that taking all other independent variables at zero, a unit increase in ACP will lead to -0.001 decrease in beta stock of the firm, a unit increase in APP will lead to 0.001 decrease in beta stock of a firm, a unit increase in current ratio will lead to a 0.2 decrease in beta stock of a firm, a unit increase in ITID will lead to a 0.001 decrease in beta stock of a firm, unit increase in LOS will lead to a 0.024 decrease in beta stock of a firm, a unit increase in FATA will lead to a 0.609 decrease in beta stock of a firm, while a unit increase in debt ratio will lead to a 0.52 increase in beta stock of a firm. The adjusted R^2 was -3.2% and the F statistics had a value of 0.401. This infers that DR and LOS had a positive relationship with beta stock of a firm while CR, ITID and FATA will lead to a negative relationship with the beta stock of a firm. However, after these findings are subjected to the F-distribution test, the critical value is 1.94 which greater than the observed the F statistic value of 0.401. Hence, there is no relationship between ACP, APP, CCC, ITD and the stock beta.

Table 4.3. 1: Regression model for average collection period

$B_{it} = \beta_o + \beta_1 (ACP_{it}) + \beta_5 (CR_{it}) + \beta_6 (DR_{it}) + \beta_7 (LOS_{it}) + \beta_8 (FATA_{it}) + \varepsilon$

Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.036	.686		-.053	.958
	CR	-.018	.029	-.053	-.620	.536
	LOS	.014	.041	.029	.334	.739
	FATA	-.660	.817	-.173	-.808	.420
	DR	.569	.960	.127	.593	.554
	ACP	.000	.002	-.009	-.101	.920

a Dependent Variable: B_I

Analysis of variance of the Regression model for average collection period

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.611	5	.122	.304	.910(a)
	Residual	59.458	148	.402		
	Total	60.070	153			

a Predictors: (Constant), ACP, CR, FATA, LOS, DR

b Dependent Variable: B_I

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.101(a)	.010	-.023	.63383

a Predictors: (Constant), ACP, CR, FATA, LOS, DR

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

The results for this regression indicates that the coefficient of ACP is zero and is highly significant at α =5%. It implies that the increase or decrease in trade receivable will not significantly affect the stock beta. The current ratio which is a traditional measure of liquidity has also a significant negative relationship with the stock beta which confirms that elements of liquidity and stock beta have inverse relationship. The debt ratio as a proxy for leverage; shows a significant positive relationship with the stock beta, which means that when leverage of the firm increases it will cause an increase in the stock beta. The log of sales used as proxy for size of a company shows a significant positive relationship with the stock beta which means that bigger size firms have less stock beta compared to firms of smaller size. The ratio of financial assets to total asset has a significant negative relation with stock beta. It reflects that if this ratio increase the stock beta will increase.

The adjusted R^2 also called the coefficient of multiple determinants is the percent of the variance in the dependent explained uniquely or jointly by the independent variables and is -2.3%. The B is the constant where the regression line intercepts the y axis, representing the amount of the dependent y will be when all the independent variables are zero. Here, B is -0.036; the probability of the coefficient is used to test the significant of R. Overall; the model is significant as F-statistics is 0.304 but less than the critical value of F-distribution value of 2.21.

Table 4.3. 2: Regression model for average payment period

Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.114	.627		-.181	.857
	CR	-.018	.029	-.052	-.612	.541
	LOS	.023	.040	.048	.559	.577
	FATA	-.596	.817	-.156	-.729	.467
	DR	.440	.967	.098	.454	.650
	APP	-.001	.001	-.079	-.930	.354

a Dependent Variable: B_I

Analysis of variance of the Regression model for average payment period

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.953	5	.191	.477	.793(a)
	Residual	59.117	148	.399		
	Total	60.070	153			

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

b Dependent Variable: B_I

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.126(a)	.016	-.017	.63201

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

Source: Regression analysis between the dependent B_I, independent (APP) and control (CR, FATA, LOS, 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:-

$$B_{it} = \beta_o + \beta_1 (APP_{it}) + \beta_5 (CR_{it}) + \beta_6 (DR_{it}) + \beta_7 (LOS_{it}) + \beta_8 (FATA_{it}) + \varepsilon$$

The coefficient of B is -0.114 and significant. The result indicates 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 stock beta. The size of the firm has a positive impact on the stock beta while other control variables like debt ratio has a positive relationship with the stock beta; which means that when leverage of the firm increases it will cause an increase in the stock beta. However, financial assets to total assets have a significant negative effect on the stock beta of a firm. The adjusted R^2 is -1.7%. The F-statistic has a value of 0.477. It reflects the significance of the model with F-distribution critical value of 2.21 which is greater than its F statistic value of 0.477.

Table 4.3. 3: Regression model for inventory turnover in days

Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.090	.624		-.145	.885
	CR	-.019	.029	-.056	-.662	.509
	LOS	.021	.040	.045	.537	.592
	FATA	-.659	.812	-.173	-.811	.419
	DR	.612	.956	.137	.640	.523
	ITD	-.001	.001	-.102	-1.227	.222

a Dependent Variable: B_I

Source: Regression analysis between the dependent B_I, independent (ITD) and control (CR, FATA, LOS, 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 Inventory turnover in days

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.206	5	.241	.607	.695(a)
	Residual	58.863	148	.398		
	Total	60.070	153			

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

b Dependent Variable: B_I

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.142(a)	.020	-.013	.63065

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

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

The third regression is run using the inventory turnover in days as an independent variable along side the control variables. This gives the model as follows:-

$B_{it} = \beta_o + \beta_1 (ITD_{it}) + \beta_5 (CR_{it}) + \beta_6 (DR_{it}) + \beta_7 (LOS_{it}) + \beta_8 (FATA_{it}) + \varepsilon$

The coefficient of intercept B has a value of -0.09 and is also significant. The coefficient of inventory turnover in days is negative -0.001 and significant at $\alpha = 5\%$ and implies that increase or decrease in the inventory turnover in days significantly affects the stock beta. This indicates that if the inventory takes more time to sell, it will increase the stock beta. The adjusted R^2 is -1.3% and the F-statistic value of 0.607 which less than the critical value of F-distribution of 2.21. However, the findings reflect a significance of the model.

Table 4.3 4: Regression model for cash conversion cycle

Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.026	.639		-.041	.967
	CR	-.018	.029	-.054	-.634	.527
	LOS	.013	.040	.027	.318	.751
	FATA	-.680	.818	-.178	-.831	.407
	DR	.621	.973	.139	.638	.524
	CCC	.000	.001	-.027	-.311	.756

a Dependent Variable: B_I

Analysis of variance of the Regression model for Cash conversion cycle

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.646	5	.129	.322	.899(a)
	Residual	59.423	148	.402		
	Total	60.070	153			

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

b Dependent Variable: B_I

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.104(a)	.011	-.023	.63365

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

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

The fourth regression, cash conversion cycle is used as an independent variable instead of average collection period, inventory turnover in days and average payment period. It is the comprehensive measure of checking efficiency of working capital management. The model derived appears as follows:-

$B_{it} = \beta_o + \beta_1 (CCC_{it}) + \beta_5 (CR_{it}) + \beta_6 (DR_{it}) + \beta_7 (LOS_{it}) + \beta_8 (FATA_{it}) + \varepsilon$

The result here indicates that the coefficient of cash conversion cycle is zero and is significant at $\alpha = 5\%$ and implies that the increase or decrease in cash conversion period will not significantly affect the stock beta of the firm. All the other variables are also significantly affecting the stock beta. The increase in sales has a positive impact on the stock beta. Current ratio has a negative impact on stock beta while other control variables like debt ratio and financial assets to total assets have a significant effect on stock beat of the firm. The adjusted R^2 is -2.3%. The value of F- statistic observed is 0.322 which is less than the critical value of F-distribution of 2.21 but the model is significant.

CHAPTER FIVE

5.0. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1. INTRODUCTION

This chapter summarizes the findings of the analysis of the relationship between working capital and beta. 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

The objective of this research was to find out the relationship between working capital management and systematic risk. In order to attain this objective a causal relation was conducted where the stock beta as the dependent variable for each of 22 sampled firms quoted at the Nairobi Stock Exchange were computed. Average collection period, average payment period, inventory turnover in days and cash conversion cycle were also calculated as independent variables and as components of working capital management. Along side the dependent and independent variables were also control variables such as current ratio, logarithm of sale, financial assets to total assets ratio and debt ratio.

A descriptive statistics analysis was conducted on all the variables to give the general behaviour of the firms quoted at the Nairobi Stock Exchange with respect to working capital management and beta. Pearson correlation coefficient analysis was also conducted to establish the relationship among the variables. The relationship between the dependent variable beta 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 independent variable, beta a regression model was conducted separately between the dependent variable, beta and each of the independent variables along side the control variables.

From the Pearson correlation coefficient analysis, the results showed some aspects of relationship among the variables. However, the analyses of each of the regression models failed in the F-test and as well as on the coefficient determination of variance where their adjusted R^2 were very low to explain any variance in the dependent variable, beta. These findings helped in drawing the conclusion of the research.

5.3. CONCLUSION

Following the findings in this study, a conclusion is drawn that there is no a statistical significant relationship between efficient working capital management and systematic risk of Kenyan firms. Hence, the alternative hypothesis; H_1 is rejected and the null hypothesis; H_0 is accepted. This conclusion is arrived at after the F-distribution test of a weak relationship as explained by the negative levels of adjusted R^2. 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 that even though it will not have direct a significant impact on the systematic risk of the firms in Kenya, the value of the firm could be enhanced. A study close to this though not similar by Loo and Ramasamy (1989) on the relationship between financial accounting variables and systematic securities risk shows that there is the influence of accounting variables on the systematic risk. However, their findings are not confirmed by the findings of this study.

5.4. RECOMMENDATIONS

The results of this study suggest that managers may not directly mitigate the effects of the systematic risk of their firms by efficient working capital management. However, 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. 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.

5.5. 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 could also have affected the results and thus the findings should not be generalized with certainty.

5.6. SUGGESTIONS FOR FURTHER RESEARCH

The studies on working capital management and systematic risk have not been exhaustively done in Kenya. Similar studies need be done in future to cover a wide sample size as well companies not quoted at the Nairobi Stock Exchange. Analysis on the firms based on different sectors of the economy need be done to draw a clear influence of working capital management on the systematic risk.

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APPENDICES

Appendix I: Presents Pearson correlation coefficients for all variables considered

		BI	ACP	APP	ITD	CCC	CR	LOS	FATA	DR
BI	Pearson Correlation	1	-.018	-.064	-.092	-.029	-.055	.051	-.050	-.024
	Sig. (2-tailed)	.	.820	.427	.258	.717	.497	.533	.538	.768
	N	154	154	154	154	154	154	154	154	154
ACP	Pearson Correlation	-.018	1	.223(**)	.243(**)	.333(**)	-.054	-.246(**)	.080	.065
	Sig. (2-tailed)	.820	.	.006	.002	.000	.505	.002	.322	.422
	N	154	154	154	154	154	154	154	154	154
APP	Pearson Correlation	-.064	.223(**)	1	.497(**)	-.420(**)	-.003	.207(**)	-.139	-.176(*)
	Sig. (2-tailed)	.427	.006	.	.000	.000	.970	.010	.086	.029
	N	154	154	154	154	154	154	154	154	154
ITD	Pearson Correlation	-.092	.243(**)	.497(**)	1	.531(**)	-.085	.142	.089	.103
	Sig. (2-tailed)	.258	.002	.000	.	.000	.294	.078	.271	.205
	N	154	154	154	154	154	154	154	154	154
CCC	Pearson Correlation	-.029	.333(**)	-.420(**)	.531(**)	1	-.093	-.144	.241(**)	.282(**)
	Sig. (2-tailed)	.717	.000	.000	.000	.	.249	.075	.003	.000
	N	154	154	154	154	154	154	154	154	154
CR	Pearson Correlation	-.055	-.054	-.003	-.085	-.093	1	-.200(*)	-.161(*)	-.193(*)
	Sig. (2-tailed)	.497	.505	.970	.294	.249	.	.013	.046	.017
	N	154	154	154	154	154	154	154	154	154
LOS	Pearson Correlation	.051	-.246(**)	.207(**)	.142	-.144	-.200(*)	1	-.079	-.038

	Sig. (2-tailed)	.533	.002	.010	.078	.075	.013	.	.332	.644
	N	154	154	154	154	154	154	154	154	154
FATA	Pearson Correlation	-.050	.080	-.139	.089	.241(**)	-.161(*)	-.079	1	.923(**)
	Sig. (2-tailed)	.538	.322	.086	.271	.003	.046	.332	.	.000
	N	154	154	154	154	154	154	154	154	154
DR	Pearson Correlation	-.024	.065	-.176(*)	.103	.282(**)	-.193(*)	-.038	.923(**)	1
	Sig. (2-tailed)	.768	.422	.029	.205	.000	.017	.644	.000	.
	N	154	154	154	154	154	154	154	154	154

* 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

25. National Bank of Kenya Limited

26. National Investment Corporation Bank 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----------

Description	**Year**						
	2009	2008	2007	2006	2005	2004	2003
Sales							
Cost of goods sold							
Total assets							
Financial assets							
Total receivables							
Inventories: opening							
Closing							
Trade payables							
Current assets							
Current liabilities							
Debt							
Annual opening stock price							
Annual closing stock price							
Dividends per common stock							
Preferred dividend							

Interest expenses							
Firm’s earnings							
Total number of shares issued							
Corporation tax							
Non current assets							

Appendix V: Variables used in the study for each company

Variable Year

	COMPANY NAME: KAPCHORUA TEA CO. LTD							
1	**YEAR**	**2009**	**2008**	**2007**	**2006**	**2005**	**2004**	**2003**
	VARIABLE							
	ACP	**68**	**84**	**63**	**75**	**92**	**86**	**98**
	APP	**95**	**38**	**72**	**34**	**69**	**57**	**38**
	ITD	**48**	**51**	**45**	**71**	**48**	**51**	**57**
	CCC	**21**	**97**	**36**	**112**	**71**	**80**	**117**
	CR	**1.68**	**1.77**	**2.01**	**2.26**	**2.16**	**2.97**	**3.11**
	LOS	**13.52**	**13.26**	**13.32**	**13.04**	**13.26**	**12.99**	**12.93**
	FATA	**0.03**	**0.01**	**0.02**	**0**	**0.01**	**0.02**	**0.06**
	DR	**0.02**	**0.01**	**0.02**	**0**	**0.01**	**0.02**	**0.06**
	BI	**0.03**	**0.01**	**-0.04**	**0.02**	**0.01**	**0.04**	**0.01**
2	**COMPANY NAME: KENYA AIRWAYS**							
	YEAR	**2009**	**2008**	**2007**	**2006**	**2005**	**2004**	**2003**
	VARIABLE							
	ACP	**46**	**44**	**40**	**36**	**36**	**38**	**35**
	APP	**41**	**44**	**56**	**67**	**70**	**72**	**67**
	ITD	**11**	**9**	**8**	**9**	**11**	**14**	**16**
	CCC	**16**	**9**	**-8**	**-22**	**-23**	**-20**	**-16**
	CR	**0.9**	**1.52**	**1.39**	**1.13**	**0.83**	**0.66**	**0.93**
	LOS	**18.09**	**17.92**	**17.89**	**17.78**	**17.56**	**17.25**	**17.06**
	FATA	**0.01**	**0.01**	**0**	**0**	**0**	**0**	**0**
	DR	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	BI	**0.11**	**0**	**0.02**	**-0.09**	**0.04**	**0.07**	**0.21**

3	**COMPANY NAME: MUMIAS SUGAR LIMITED**								
	YEAR	**2009**	**2008**	**2007**	**2006**	**2005**	**2004**	**2003**	
	VARIABLE								
	ACP	**101**	**80**	**74**	**44**	**46**	**59**	**75**	
	APP	**109**	**87**	**61**	**63**	**61**	**54**	**99**	
	ITD	**41**	**38**	**33**	**40**	**52**	**59**	**97**	
	CCC	**33**	**31**	**46**	**21**	**37**	**64**	**73**	
	CR	**1.36**	**1.35**	**2.28**	**2.18**	**2.27**	**1.97**	**1.35**	
	LOS	**16.28**	**16.3**	**16.16**	**16.27**	**16.13**	**16.1**	**15.85**	
	FATA	**0.05**	**0.08**	**0.02**	**0.07**	**0.09**	**0.04**	**0.05**	
	DR	**0.05**	**0.07**	**0.01**	**0.07**	**0.09**	**0.04**	**0.05**	
	BI	**5.9**	**-0.02**	**0.03**	**-0.1**	**0.03**	**0.24**	**0.26**	
4	**COMPANY NAME: SAMEER AFRICA**								
	YEAR	**2009**	**2008**	**2007**	**2006**	**2005**	**2004**	**2003**	
	VARIABLE								
	ACP	**48**	**76**	**83**	**85**	**71**	**65**	**56**	
	APP	**21**	**37**	**44**	**100**	**101**	**97**	**84**	
	ITD	**148**	**155**	**138**	**190**	**193**	**162**	**185**	
	CCC	**175**	**194**	**177**	**175**	**163**	**130**	**157**	
	CR	**2.97**	**2.14**	**1.86**	**1.73**	**2.17**	**2.3**	**3.22**	
	LOS	**15**	**14.92**	**15.06**	**14.94**	**15.03**	**15**	**14.75**	
	FATA	**0.28**	**0.33**	**0.31**	**0.25**	**0.12**	**0.08**	**0**	
	DR	**0.16**	**0.22**	**0.25**	**0.19**	**0.12**	**0.08**	**0**	
	BI	**-0.42**	**0**	**0.05**	**-0.24**	**0.07**	**-0.39**	**0.13**	
5	**COMPANY NAME: CROWN BERGER (K) LTD**								
	YEAR	**2009**	**2008**	**2007**	**2006**	**2005**	**2004**	**2003**	
	VARIABLE								

	ACP	**69**	**89**	**71**	**89**	**72**	**70**	**72**	
	APP	**94**	**94**	**109**	**131**	**74**	**78**	**65**	
	ITD	**128**	**127**	**142**	**186**	**180**	**167**	**146**	
	CCC	**103**	**122**	**104**	**144**	**178**	**159**	**153**	
	CR	**1.44**	**1.24**	**1.59**	**1.6**	**1.6**	**1.72**	**2.01**	
	LOS	**14.75**	**14.69**	**14.55**	**14.34**	**14.18**	**14.02**	**13.96**	
	FATA	**0.15**	**0.1**	**0.1**	**0.08**	**0.1**	**0.15**	**0.04**	
	DR	**0.14**	**0.08**	**0.04**	**0.02**	**0.02**	**0.07**	**0.04**	
	BI	**-0.64**	**0.03**	**-0.01**	**-0.01**	**0.07**	**0.59**	**0.14**	
6	**COMPANY NAME: TOTAL KENYA**								
	YEAR	**2009**	**2008**	**2007**	**2006**	**2005**	**2004**	**2003**	
	VARIABLE								
	ACP	**132**	**45**	**53**	**54**	**35**	**40**	**34**	
	APP	**102**	**30**	**53**	**69**	**17**	**32**	**16**	
	ITD	**72**	**33**	**54**	**58**	**38**	**43**	**49**	
	CCC	**103**	**48**	**54**	**43**	**56**	**51**	**67**	
	CR	**1.12**	**1.24**	**1.26**	**1.17**	**1.3**	**1.36**	**1.5**	
	LOS	**17.3**	**17.61**	**17.36**	**17.24**	**17.33**	**17.27**	**16.75**	
	FATA	**0.42**	**0.35**	**0.23**	**0.33**	**0.39**	**0.29**	**0.16**	
	DR	**0.42**	**0.35**	**0.22**	**0.33**	**0.39**	**0.29**	**0.16**	
	BI	**0.03**	**0.03**	**-0.12**	**0.05**	**0.04**	**0.4**	**0.05**	
7	**COMPANY NAME: TPS SERENA LTD**								
	YEAR	**2009**	**2008**	**2007**	**2006**	**2005**	**2004**	**2003**	
	VARIABLE								
	ACP	**81**	**98**	**103**	**71**	**127**	**123**	**163**	
	APP	**62**	**110**	**112**	**87**	**232**	**238**	**270**	
	ITD	**26**	**31**	**24**	**20**	**102**	**109**	**149**	

	CCC	**45**	**19**	**15**	**4**	**-3**	**-6**	**42**	
	CR	**1.58**	**1.23**	**1.05**	**1.51**	**6.11**	**2.06**	**1.11**	
	LOS	**15.22**	**14.99**	**15.12**	**15**	**14.49**	**14.33**	**14.01**	
	FATA	**0.38**	**0.38**	**0.38**	**0.41**	**0.25**	**0.2**	**0.27**	
	DR	**0.22**	**0.21**	**0.22**	**0.24**	**0.24**	**0.19**	**0.26**	
	BI	**-0.03**	**0.01**	**0**	**-0.12**	**0**	**0.01**	**0.06**	
8	**COMPANY NAME: WILLIAMSON TEA KENYA LIMITED**								
	YEAR	**2009**	**2008**	**2007**	**2006**	**2005**	**2004**	**2003**	
	VARIABLE								
	ACP	**122**	**145**	**91**	**87**	**96**	**105**	**119**	
	APP	**130**	**77**	**105**	**60**	**66**	**85**	**64**	
	ITD	**68**	**60**	**62**	**55**	**67**	**81**	**66**	
	CCC	**60**	**98**	**48**	**82**	**97**	**101**	**121**	
	CR	**1.87**	**2.18**	**2.38**	**2.49**	**2.92**	**3.11**	**2.58**	
	LOS	**14.21**	**13.91**	**14**	**13.8**	**14**	**13.66**	**13.64**	
	FATA	**0.09**	**0.2**	**0.09**	**0.1**	**0.11**	**0.14**	**0.11**	
	DR	**0.02**	**0.2**	**0.01**	**0.01**	**0.01**	**0.04**	**0.02**	
	BI	**0.02**	**0.01**	**0.02**	**0**	**-0.03**	**-0.04**	**0.02**	
9	**COMPANY NAME: SASINI LIMITED.**								
	YEAR	**2009**	**2008**	**2007**	**2006**	**2005**	**2004**	**2003**	
	VARIABLE								
	ACP	**45**	**68**	**69**	**50**	**45**	**41**	**47**	
	APP	**67**	**111**	**68**	**61**	**107**	**110**	**88**	
	ITD	**68**	**93**	**64**	**57**	**52**	**55**	**63**	
	CCC	**46**	**50**	**65**	**46**	**-10**	**-14**	**22**	
	CR	**2.56**	**2.69**	**2.03**	**2.99**	**14.93**	**18.12**	**2.66**	
	LOS	**14.6**	**14.18**	**14.1**	**14.05**	**13.74**	**13.85**	**13.66**	

	FATA	**0**	**0**	**0.01**	**0**	**0**	**0**	**0**	
	DR	**0**	**0**	**0.01**	**0**	**0**	**0**	**0**	
	BI	**4.2**	**0.02**	**0.44**	**0.04**	**-0.84**	**0**	**0.07**	
10	**COMPANY NAME: EAST AFRICAN BREWERIES LIMITED**								
	YEAR	**2009**	**2008**	**2007**	**2006**	**2005**	**2004**	**2003**	
	VARIABLE								
	ACP	**44**	**46**	**59**	**41**	**42**	**39**	**32**	
	APP	**193**	**2020**	**237**	**190**	**210**	**265**	**222**	
	ITD	**138**	**138**	**154**	**171**	**198**	**250**	**266**	
	CCC	**-11**	**-16**	**-24**	**22**	**30**	**24**	**76**	
	CR	**2.01**	**1.98**	**2.21**	**1.45**	**1.47**	**2.82**	**2.45**	
	LOS	**17.35**	**17.3**	**17.12**	**16.86**	**16.77**	**16.62**	**16.54**	
	FATA	**0.05**	**0.04**	**0.03**	**0.04**	**0.05**	**0.06**	**0.09**	
	DR	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
	BI	**0.15**	**0.02**	**0.01**	**-0.08**	**0.01**	**0.26**	**0.01**	
11	**COMPANY NAME: CAR AND GENERAL.**								
	YEAR	**2009**	**2008**	**2007**	**2006**	**2005**	**2004**	**2003**	
	VARIABLE								
	ACP	**59**	**77**	**68**	**61**	**54**	**72**	**69**	
	APP	**73**	**129**	**148**	**154**	**128**	**211**	**162**	
	ITD	**134**	**157**	**115**	**162**	**151**	**189**	**156**	
	CCC	**120**	**105**	**35**	**69**	**77**	**50**	**63**	
	CR	**1.3**	**1.29**	**1.32**	**1.36**	**1.32**	**1.39**	**1.39**	
	LOS	**15.29**	**14.91**	**14.43**	**14.03**	**13.88**	**13.35**	**13.1**	
	FATA	**0.31**	**0.22**	**0.21**	**0.12**	**0.14**	**0.11**	**0.11**	
	DR	**0.31**	**0.22**	**0.21**	**0.12**	**0.14**	**0.11**	**0.11**	
	BI	**0**	**0.03**	**-0.15**	**0.02**	**0**	**0.11**	**-0.16**	

12	**COMPANY NAME: REA VIPINGO PLANTATIONS LIMITED**								
	YEAR	**2009**	**2008**	**2007**	**2006**	**2005**	**2004**	**2003**	
	VARIABLE								
	ACP	**46**	**70**	**62**	**45**	**44**	**73**	**66**	
	APP	**59**	**61**	**57**	**49**	**50**	**56**	**56**	
	ITD	**258**	**149**	**127**	**137**	**159**	**134**	**127**	
	CCC	**245**	**158**	**132**	**133**	**153**	**151**	**137**	
	CR	**2.24**	**1.45**	**1.59**	**1.54**	**1.74**	**1.58**	**1.37**	
	LOS	**14.13**	**14.12**	**14.02**	**13.98**	**13.91**	**13.68**	**13.46**	
	FATA	**0.09**	**0.27**	**0.18**	**0.18**	**0.2**	**0.25**	**0.31**	
	DR	**0.09**	**0.27**	**0.18**	**0.18**	**0.2**	**0.25**	**0.31**	
	BI	**-0.09**	**0.03**	**0.11**	**-0.18**	**0.02**	**-0.1**	**0.44**	
13	**COMPANY NAME: KAKUZI**								
	YEAR	**2009**	**2008**	**2007**	**2006**	**2005**	**2004**	**2003**	
	VARIABLE								
	ACP	**26**	**35**	**36**	**66**	**58**	**30**	**23**	
	APP	**28**	**36**	**55**	**69**	**80**	**55**	**53**	
	ITD	**13**	**11**	**18**	**27**	**33**	**29**	**39**	
	CCC	**11**	**10**	**-1**	**24**	**11**	**4**	**9**	
	CR	**2.05**	**0.73**	**0.62**	**0.65**	**0.5**	**0.61**	**0.53**	
	LOS	**14.51**	**14.29**	**14.23**	**14.15**	**13.92**	**14.17**	**14.09**	
	FATA	**0.06**	**0.08**	**0.27**	**0.29**	**0.3**	**0.24**	**0.26**	
	DR	**0**	**0**	**0.18**	**0.28**	**0.29**	**0.23**	**0.25**	
	BI	**-0.09**	**0.03**	**0.11**	**-0.18**	**0.02**	**-0.1**	**0.44**	
14	**COMPANY NAME: NATION MEDIA GROUP.**								
	YEAR	**2009**	**2008**	**2007**	**2006**	**2005**	**2004**	**2003**	

	VARIABLE								
	ACP	**65**	**71**	**57**	**62**	**84**	**89**	**50**	
	APP	**243**	**351**	**314**	**265**	**242**	**270**	**353**	
	ITD	**119**	**124**	**91**	**113**	**94**	**87**	**97**	
	CCC	**-59**	**-156**	**-166**	**-90**	**-64**	**-94**	**-206**	
	CR	**2.55**	**2.29**	**2.4**	**2.95**	**3.03**	**2.63**	**2.5**	
	LOS	**15.92**	**15.93**	**15.85**	**15.66**	**15.54**	**15.4**	**15.31**	
	FATA	**0.18**	**0.17**	**0.1**	**0.04**	**0.05**	**0.04**	**0.04**	
	DR	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
	BI	**-0.02**	**0**	**0**	**0**	**0.01**	**0.07**	**0.01**	
15	**COMPANY NAME: EAST AFRICA CABLES LIMITED**								
	YEAR	**2009**	**2008**	**2007**	**2006**	**2005**	**2004**	**2003**	
	VARIABLE								
	ACP	**127**	**104**	**124**	**96**	**91**	**78**	**70**	
	APP	**77**	**49**	**66**	**75**	**165**	**71**	**101**	
	ITD	**149**	**122**	**131**	**130**	**118**	**102**	**126**	
	CCC	**199**	**177**	**189**	**151**	**44**	**109**	**95**	
	CR	**2.55**	**2.29**	**2.4**	**2.95**	**3.03**	**2.63**	**2.5**	
	LOS	**14.85**	**15.18**	**15.06**	**14.53**	**13.97**	**13.62**	**12.97**	
	FATA	**0.31**	**0.34**	**0**	**0**	**0.14**	**0**	**0**	
	DR	**0.31**	**0.34**	**0**	**0**	**0**	**0**	**0**	
	BI	**-0.02**	**0.02**	**0.44**	**0**	**-0.01**	**0.06**	**0.13**	
16	**COMPANY NAME: THE STANDARD GROUP LIMITED**								
	YEAR	**2009**	**2008**	**2007**	**2006**	**2005**	**2004**	**2003**	
	VARIABLE								
	ACP	**117**	**101**	**109**	**74**	**71**	**61**	**70**	
	APP	**159**	**185**	**185**	**158**	**131**	**200**	**234**	

	ITD	**87**	**86**	**63**	**48**	**77**	**83**	**48**	
	CCC	**45**	**2**	**-13**	**-36**	**17**	**-56**	**-116**	
	CR	**1.27**	**1.37**	**1.33**	**1.43**	**1.05**	**0.97**	**0.93**	
	LOS	**14.83**	**14.85**	**14.77**	**14.9**	**14.5**	**14.38**	**14.23**	
	FATA	**0.16**	**0.18**	**0.02**	**0.05**	**0.14**	**0**	**0**	
	DR	**0.14**	**0.17**	**0.2**	**0.04**	**0.14**	**0**	**0**	
	BI	**0.01**	**0**	**0.08**	**0.03**	**0.02**	**-0.6**	**0.1**	
17	**COMPANY NAME: BRITISH AMERICAN TOBACCO.**								
	YEAR	**2009**	**2008**	**2007**	**2006**	**2005**	**2004**	**2003**	
	VARIABLE								
	ACP	**30**	**36**	**36**	**34**	**27**	**33**	**22**	
	APP	**125**	**136**	**126**	**139**	**108**	**130**	**133**	
	ITD	**105**	**104**	**109**	**118**	**113**	**113**	**120**	
	CCC	**10**	**4**	**19**	**13**	**32**	**16**	**9**	
	CR	**0.92**	**1.05**	**1.13**	**1.26**	**1.51**	**1.48**	**1.81**	
	LOS	**16.75**	**16.67**	**16.57**	**16.37**	**16.23**	**16.1**	**16.06**	
	FATA	**0.16**	**0.12**	**0.09**	**0.05**	**0.03**	**0.03**	**0**	
	DR	**0.16**	**0.12**	**0.09**	**0.08**	**0.07**	**0.14**	**0**	
	BI	**0.01**	**-0.03**	**0**	**0.01**	**0.08**	**0.06**	**0.02**	
18	**COMPANY NAME: CMC HOLDINGS LIMITED.**								
	YEAR	**2009**	**2008**	**2007**	**2006**	**2005**	**2004**	**2003**	
	VARIABLE								
	ACP	**138**	**133**	**121**	**131**	**135**	**130**	**130**	
	APP	**233**	**244**	**229**	**188**	**150**	**140**	**172**	
	ITD	**235**	**212**	**206**	**190**	**181**	**185**	**224**	
	CCC	**140**	**101**	**98**	**133**	**166**	**175**	**176**	
	CR	**1.44**	**1.46**	**1.52**	**1.57**	**1.48**	**1.53**	**1.57**	

	LOS	**16.28**	**16.26**	**16.01**	**15.81**	**15.73**	**15.62**	**15.32**	
	FATA	**0.01**	**0.01**	**0.08**	**0.13**	**0.23**	**0.24**	**0.22**	
	DR	**0.01**	**0**	**0.07**	**0.17**	**0.22**	**0.23**	**0.21**	
	BI	**0.03**	**0**	**-0.28**	**0.02**	**-0.03**	**0.14**	**0.05**	
19	**COMPANY NAME: MARSHALS (E.A.) LIMITED**								
	YEAR	**2009**	**2008**	**2007**	**2006**	**2005**	**2004**	**2003**	
	VARIABLE								
	ACP	**162**	**116**	**87**	**68**	**55**	**34**	**46**	
	APP	**181**	**109**	**105**	**108**	**121**	**110**	**114**	
	ITD	**279**	**195**	**194**	**181**	**171**	**162**	**128**	
	CCC	**260**	**202**	**176**	**141**	**105**	**86**	**60**	
	CR	**0.89**	**1.29**	**1.23**	**1.23**	**1.21**	**0.82**	**0.8**	
	LOS	**13.29**	**13.7**	**14.07**	**14.08**	**14.05**	**14.06**	**14.32**	
	FATA	**0.65**	**0.78**	**0.49**	**0.4**	**0.72**	**0.29**	**0.46**	
	DR	**0.51**	**0.61**	**0.34**	**0.3**	**0.66**	**0.23**	**0.4**	
	BI	**-0.01**	**0.03**	**-0.54**	**0.03**	**-0.01**	**0.03**	**0.18**	
20	**COMPANY NAME: ATHI RIVER MINING LIMITED.**								
	YEAR	**2009**	**2008**	**2007**	**2006**	**2005**	**2004**	**2003**	
	VARIABLE								
	ACP	**98**	**75**	**39**	**89**	**78**	**78**	**87**	
	APP	**125**	**97**	**65**	**117**	**97**	**141**	**85**	
	ITD	**104**	**83**	**64**	**64**	**75**	**79**	**82**	
	CCC	**77**	**61**	**38**	**36**	**56**	**16**	**84**	
	CR	**1**	**1.02**	**1.11**	**0.98**	**2.03**	**1.04**	**1.65**	
	LOS	**15.45**	**15.35**	**15.17**	**14.77**	**14.61**	**14.31**	**14.03**	
	FATA	**0.18**	**0.16**	**0.13**	**0.12**	**0.03**	**0.1**	**0.05**	
	DR	**0.18**	**0.16**	**0.13**	**0.12**	**0.03**	**0.1**	**0.05**	

	BI	**0.01**	**0.06**	**-0.1**	**-0.01**	**0.08**	**0.62**	**0.22**	
21	**COMPANY NAME: EAST AFRICA PORTLAND CEMENT CO. LTD**								
	YEAR	**2009**	**2008**	**2007**	**2006**	**2005**	**2004**	**2003**	
	VARIABLE								
	ACP	**31**	**27**	**20**	**19**	**9**	**13**	**48**	
	APP	**79**	**71**	**68**	**69**	**46**	**73**	**81**	
	ITD	**60**	**63**	**48**	**46**	**59**	**88**	**87**	
	CCC	**12**	**19**	**0**	**-4**	**22**	**28**	**54**	
	CR	**2.07**	**2.26**	**2.21**	**2.45**	**3.3**	**2.23**	**2.42**	
	LOS	**15.91**	**15.79**	**15.67**	**15.64**	**15.5**	**15.24**	**15.16**	
	FATA	**0.25**	**0.27**	**0.26**	**0.34**	**0.46**	**0.54**	**1**	
	DR	**0.24**	**0.27**	**0.26**	**0.33**	**0.46**	**0.54**	**0.49**	
	BI	**-0.03**	**0.01**	**-0.01**	**-0.07**	**2.05**	**0.3**	**0.08**	
22	**COMPANY NAME: KENYA POWER AND LIGHTING COMPANY LMITED.**								
	YEAR	**2009**	**2008**	**2007**	**2006**	**2005**	**2004**	**2003**	
	VARIABLE								
	ACP	**48**	**115**	**95**	**68**	**74**	**87**	**100**	
	APP	**11**	**27**	**565**	**546**	**607**	**96**	**135**	
	ITD	**426**	**601**	**570**	**421**	**383**	**28**	**32**	
	CCC	**463**	**689**	**100**	**-76**	**-150**	**19**	**-3**	
	CR	**0.87**	**1.12**	**1.07**	**1.31**	**1.28**	**1.13**	**0.84**	
	LOS	**18.01**	**17.55**	**17.48**	**17.37**	**17.18**	**16.99**	**17**	
	FATA	**0.22**	**0.22**	**0.14**	**0.08**	**0.1**	**0.13**	**0.21**	
	DR	**0.22**	**0.22**	**0.14**	**0.08**	**0.1**	**0.13**	**0.21**	
	BI	**0.11**	**0**	**-0.02**	**0**	**0**	**-0.04**	**0.06**	