RELATIONSHIP BETWEEN CASH CONVERSION CYCLE AND FINANCIAL PERFORMANCE OF COMPANIES LISTED AT THE NAIROBI STOCK EXCHANGE

BY
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DECLARATION

This research project is my original work and has not been submitted for award of a degree in any other university.

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DEDICATION

To my wife Beth and the boys Alvin and Mark for their patience and support
ABSTRACT

Studies such as Jose et al. (1996) and Soenen (1993) show a strong link between cash conversion cycle and financial performance. However, there are hardly such studies on the developing and least developed countries. This study examined the cash conversion cycle and financial performance of firms listed at the Nairobi Stock Exchange for the period 2006 to 2010. The objective was to establish the relationship between cash conversion cycle and financial performance.

The study used descriptive analysis and the correlation model. The data was obtained from the Nairobi Stock Exchange. A sample of 30 companies selected from the agricultural, commercial and services, and industrial and allied sectors was studied. The Pearson Correlation coefficient was calculated to establish the relationship and a t-test administered to determine the significance of the relationship.

The key finding from the study was that there exists a negative relationship between cash conversion cycle and financial performance of firms listed in the Nairobi Stock Exchange. The correlation coefficient of the association was -0.202. This inverse relationship was found more pronounced in the agricultural sector, which had a correlation coefficient of -0.329. The findings suggest that firms with short cash conversion cycle are likely to perform better than those with long cash cycles. The study therefore encourages firms to shorten their cash cycles as much as possible.
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<tr>
<td>CCC</td>
<td>Cash Conversion Cycle</td>
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<tr>
<td>CFO</td>
<td>Chief Finance Officer</td>
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<td>CMA</td>
<td>Capital Markets Authority</td>
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<td>DCF</td>
<td>Discounting Cash Flows</td>
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<td>Ri</td>
<td>Rate of Return</td>
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1.1 Background of the Study

A firm is required to maintain a balance between liquidity and profitability while conducting its day to day operations. Liquidity is a precondition to ensure that a firm is able to meet its short-term obligations and its continued flow can be guaranteed from a profitable venture (Gitman, 1984). Cash is without doubt the life blood of business, unfortunately rapidly changing conditions impact on cash and the amount a company has invested in its own cash cycle (Jose et al., 1996).

The importance of efficient cash management was highlighted in the mid 2000 decline of Amazon.com stock price. Ames and Wolverton (2000) argued that an influential Lehman Brothers Inc. bond analyst Ravi Suria issued a stern warning about Amazon.com “weak balance sheet, poor working capital management, and massive negative operating cash flow.” Within days, the company’s stock, which had reached a 52-week high prior to the warning plummeted more than two-thirds. Carlton (2000) and Schwartz (2000) identified poor working capital management as the cause of Amazon’s stock price decline.

In the past 10 years the Kenyan economy has witnessed companies closing down due to working capital management related difficulties for example the Uchumi Supermarket. Mugo (2007) identified the main reason for the collapse of the supermarket as poor working capital management. Growing concerns over how to provide adequate cash to meet bills and debt obligations at a minimum cost has
caused firms to focus more on "cash conservation". The cash management policies of commercial enterprises involve establishing optimal levels of accounts payable, inventory and accounts receivable by considering the economic trade-offs that exist with respect to them. The effectiveness of the firm in managing these accounts can therefore be assessed by evaluating the length of its cash cycle, which reflects on average, the length of time the firm’s cash is invested in inventory and receivables (Gitman et al., 1979).

1.1.1 Cash Conversion Cycle (CCC)

The cash conversion cycle has been defined inconsistently. Horne & Wachowicz (2001) defines cash conversion cycle as the length of time from the actual outlay of cash for purchases until the collection of receivables resulting from the sale of goods and services. Stewart (1995) described CCC as the average days required to turn a dollar invested in raw material into a dollar collected from a customer. Gallinger (1997) used the operating cycle and defined CCC as a measure of the number of days the firm’s operating cycle requires costly financing to support it. Moss and Stine (1993) described CCC as the number of days between accounts payable and accounts receivable. Keown et al. (2003) defined CCC as the sum of days sales outstanding (average collection period) and the days of sales in inventory less days of payables outstanding. Jordan (2003) identified the cash cycle components as: average age of inventory, average collection period of accounts receivable and, average payment period of accounts payable. Calculating the cash cycle requires determining the number of days cash is invested in each of the cash cycle components.
The concept of cash conversion cycle as shown in Richards and Laughlin (1980) is based on the accrual accounting information and is indirectly related to a firm's performance. A shorter CCC usually indicates that the firm is receiving cash quickly while paying suppliers close to the due date. The result is a higher present value of the net cash flows and the value of the firm. The shorter the CCC the more efficient the internal operations of a firm and the closer the availability of net cash flow, which suggests a more liquid condition of the firm and vice versa (Gentry et al., 1990).

Richards and Laughlin (1980) argue that the concept depicts the residual time interval over which additional non-spontaneous financing must be negotiated to compensate for the non-instantaneous and unsynchronized nature of a firm's working capital. The residual cash flow financing period depicted by the CCC is influenced by either expansion or contraction in any of the three liquidity flow measures: the inventory conversion period, receivables conversion period or the payables deferral period. An increase in the length of the operating cycle without simultaneously lengthening the payable deferral period creates additional liquidity management problems associated with the need to acquire additional non spontaneous financing over a longer and potentially less certain cash conversion period.

Farris and Hutchison (2002) argue that the CCC holds importance from accounting and supply chain management perspectives. For accounting purposes, the metric can be used to help measure liquidity and for supply chain management activities it serves as a measurement bridging the processes into and out of the firm. Lancaster and Stevens (1996) observe that by reflecting the net time interval between actual cash expenditures for the purchase of productive resources and the ultimate collection of
receipts from product sales, the CCC provides a valid alternative for measuring corporate liquidity and depicting a company’s average liquidity position.

Moss and Stine (1993) identified the CCC as useful tool of assessing the liquidity of a firm. It measures the time lag between cash payments for purchase of inventories and collection of receivables from customers. The longer this time lag, the larger the investment in working capital. Thus the length of the CCC determines the degree to which the firm must rely on external financing.

Schilling (1996) argues that a direct relationship exists between the length of the CCC and the minimum liquidity required. If the cash conversion cycle lengthens the minimum liquidity required increases, and if the cash conversion cycle shortens, the minimum liquidity required decreases. Soenen (1993) observed that the firm value is also closely related to cash conversion cycle. A shorter CCC results in a higher present value of net cash flows generated by assets and therefore, a higher firm value.

The cash conversion cycle concept becomes increasingly applicable as firms experience greater volatility in their sales revenue and, therefore greater uncertainty in predicting the amount and timing of their cash receipts in response to changing economic conditions (Richards and Laughlin, 1980).
1.1.2 Financial Performance

Melvin and Hirt (2005) define performance as the development of share price, and profitability or the present value of a company. Jeon and Miller (2006) argue that the performance gives an extremely greater impact on a firm in determining the healthy level either positive or negative. Bacidore et al. (1997) demonstrates the significance of performance by arguing that executive compensation should be tied to company performance because if managers are offered compensation contracts that are tied to shareholder wealth changes, their incentives will be better aligned with those of shareholders than is the case for other types of contracts.

Several measures of financial performance are available such as: the stock price itself (Jensen and Murphy, 1990), the economic value added (EVA) (Stewart, 1991), return on investment (ROI) (Reese and Cool, 1978), the earning per share (EPS) (Ross et al., 1993), real options (Myers, 1984) and the discounted cash flow (DCF) (Kaplan, 1983). Dechow (1994) observed that the earnings is the most frequently used measure of financial performance. The stock prices are viewed as encompassing the information in realized cash flows and earnings concerning financial performance. Financial performance is determined by industry structure and firm’s strategic position in the industry and the choice of a performance measure is driven by the business strategy (Porter, 1991). Voss and Voss (2000) identified industry characteristics, the strategic position, product characteristics and organizational characteristics as the four categories of variables that have been proposed by various researchers as having a direct effect on performance.
1.1.3 Nairobi Stock Exchange (NSE)

The Nairobi Stock Exchange deals in exchange of securities issued by publicly quoted companies and the government. Wagacha (2001) described the NSE as a market that provides enterprises with a non bank-source of financing through the sale of shares to the public. It provides not only the substitution but also diversification of risk to entrepreneurs as they raise capital through equity. The NSE was incorporated in 1954. The NSE has two market indices; the NSE 20-Share Index which is price weighted and an all inclusive NSE All Shares Index (NASI) which is market capitalization weighted. In 2009, based on the performance of the equity markets, the NSE was ranked fifth in terms of equity market capitalization behind South Africa, Morocco, Egypt and Nigeria in descending order (NSE, 2009).

The NSE comprised of 47 listed companies as at April, 2011, with a combined market capitalization of Kshs.1143 billion (NSE, 2011). From 2006, trading at the NSE was fully automated, under the Automated Trading System (ATS). ATS ensures that transactions are concluded with speed and accuracy. Delivery versus Payment (DvP) is concluded in 3 days (t+3), which is the internationally accepted standard (NSE, 2007). In November 2009, automated trading was extended to include Government bonds (NSE, 2009).

1.2 Statement of the Research Problem

One of the principles of finance is to collect cash as quickly as possible and postpone the outflows as long as possible (Gentry et al., 1990). On the other hand, a key financial goal of the firm is to maximize growth. A trade-off between these two financial goals is necessary for the continued survival of the firm. If the firm does not
care about growth, it’s unlikely to survive for a longer period. While if liquidity is not looked at carefully the firm may face the problem of insolvency (Jose et al., 1996). The key management problem therefore is to maintain an optimum cash balance that contributes positively towards the firm’s performance (Schilling, 1996). One of the measures used to achieve a balance between liquidity and performance is the cash conversion cycle (Deloof, 2003).

Studies such as Richards and Laughlin (1980), Shin and Soenen (1998), Deloof (2003) and, Lazaridis and Trfondis (2006) show a strong link between cash conversion cycle and financial performance. However there are barely such studies on the developing and least developed countries. Local factors like firms’ size, level of resources such as technology and capital, business and liquidity risks render generalizing the findings of those studies in these countries impractical. Meanwhile the strength of the conventional liquidity analysis methods namely, the current and quick ratios in assessing a firm’s adequate liquidity position and the efficiency of ongoing operation activities is diminishing because they are derived from the balance sheet at a particular point of time (Gallinger, 1997). This certainly creates a favourable opportunity to undertake a study for Kenya on cash conversion cycle because the CCC provides more explicit implications to supplement the traditional methods for managing firms’ liquidity.

Some of the liquidity management studies on NSE include: Kiprono (2004) analysis of the relationship between cash flows and earnings performance measures of firms listed in the NSE. He examined the financial statements of companies listed during the period 1998 to 2002 and found no significant relationship between cash flow and
earnings performance. Ochieng (2006) studied the relationship between working capital of firms listed in the NSE and economic activity in Kenya and concluded that liquidity increased slightly during economic expansion and reduced during economic slow downs. These studies cover cash flow analysis from an asset liquidation value approach but the cash conversion cycle approach by this study addresses operating cash flow by integrating the receivables, inventory and payables turnover experiences.

The Nairobi stock exchange was selected for a variety of reasons. First the companies listed subscribe to standard listing procedures that make the data comparable (NSE, 2010). Second the NSE is regulated by the Capital Markets Authority (CMA) thus, the data is relatively reliable for research than that obtained from private companies (CMA, 2003). The study examined the cash conversion cycles and the financial performance of companies quoted at the NSE. The study sought to answer the question: What is the relationship between financial performance and cash conversion cycle of companies listed at the NSE?

1.3 The Research Objective

The objective of this study was to establish the relationship between cash conversion cycle and financial performance of companies listed at the NSE.

1.4 Value of the Study

The study offers valuable contribution in theory and practice. First investors will find the study helpful in the management of both upstream and downstream supply chain systems. An understanding of the cash conversion cycle will ensure efficient business processes, as it bridges across inbound material activities with suppliers, through
manufacturing operations, and the outbound logistics and sales activities with customers (Farris and Hutchison, 2002).

Chief finance officers (CFOs) and general financial practitioners will find the results of this study helpful in their day to day business decision making processes. One of the key responsibilities of the CFO is ensuring cash availability for both routine and investment activities. An understanding of the management of the CCC would enhance the CFO’s ability to generate more funds. For example a negative cash cycle translates to using suppliers monies to finance daily operations. Whereas a shorter inventory cycle, longer payable cycle and shorter receivable would free more funds from routine operations to investment and generate additional income. This is in line with two key financial goals of a firm, namely ensuring funds availability and maximizing growth. The study would give managers more confidence to invest in efforts that improve the components of the cash conversion cycle.

Finally the study would add to the body of knowledge in the financial management discipline and will form a basis for further research. Studies on the relationship between cash conversion cycle and other variables like firm size, and supply chain are worth carrying out. Also it may be helpful to find out whether there is a more precise method of calculating the cash conversion cycle. For example, Gentry et al., (1990) proposes using a weighted cash conversion cycle which is a two-part multiplicative measure consisting of the computation of a weighted operating cycle and a weighted payable effect that measures the number of weighted dollar-days that cash payments are deferred to suppliers.
CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter discusses some of the major theories of cash management, the relationship between cash cycle and performance and some of the available measures of financial performance. The chapter concludes with a brief summary of the gap in literature that the study contributes.

2.2 Cash Management Theories

Keynes (1936) described the key motives of holding cash balances as transactions, precautionary, and speculative. Transactions balances are maintained to meet the payment of known obligations. Precautionary balances are held as a cushion for uncertainty and speculative balances are held with the expectation of purchasing desired financial instruments more cheaply at some future date. Keynes's proposition established the foundation for the development of the cash balances theories (Gitman et al., 1979). Key developments in cash management began in the 1950s. Baumol (1952) and Tobin (1956) developed theories on how the transaction demand for money is related to interest rate. As interest rates raise the opportunity cost of holding cash for transactions also rise, so the transaction part of money demand is negatively related to the interest rate. They came up with the Baumol-Tobin model.

Baumol (1952) equated cash to inventory and looked at the management of cash as similar to inventory management problem. He extended the economic order quantity (EOQ) model to examine its implications to cash management. The Baumol model
assumes the cash manager invests excess funds in interest bearing securities and
liquidates them to meet the firm's demand for cash. As investment returns increase,
the opportunity cost of holding cash increases and the cash manager decreases cash
balances. As transaction costs increase, the cash manager decreases the number of
times he liquidates securities, leading to higher cash balances. Baumol (1952) argues
that managing cash and short term investments mix involves determining the optimal
frequency for replenishing cash and the amount of securities to liquidate. Money is
therefore both a store of value and a medium of exchange.

Beranek, White and, Norman (1963) improved on the weakness of Baumol model, by
developing their model based on the probability distribution of net cash flow. The
decision variable in Beranek's model is the allocation of funds between cash and
investments at the beginning of the period. Withdrawals from investment are assumed
possible only at the end of each planning period. Thus in Beranek's model, the
financial manager is regarded as having total resources of K dollars available at the
beginning of a planning period. He expects his net cash drain at the end of the period
to be Y dollars, with a probability distribution. His objective of maximizing returns by
investment in securities is constrained by transaction costs and the risk of being short
of cash when funds are needed for expenditures. Beranek developed a cost function
and differentiated it to find the optimal cash balance. Beranek model ignores the
alternative of liquidating investments to meet cash needs.

Archer (1966) developed the Archer model. His model gave critical emphasis on the
precautionary and speculative motives. Archer developed cash balance computation
based on means and standard deviations arrived at by an empirical study of past cash
requirements. By empirical analysis of cash needs day by day over a period of years, he determined the individual firm’s expected variability in net cash flow for transaction purposes. However, he never developed a sophisticated formula for quantifying the optimal balances.

Mckernie-Belt (1966) developed the Mckernie-Belt model. This model gave critical emphasis on the goodwill balance required by banks for minimum desired cash balance. He indicated that this cash need is found by frequent and constant projections of future cash needs. This model doesn’t give any further analysis for precautionary, speculative motive, carrying costs, and the like and loses much of the sophistication of the more theoretical models for quantifying the optimal cash balance.

Miller and Orr (1966) improved the Baumol’s model by allowing for fluctuations in cash flow balances. He introduced lower and upper control limits to monitor fluctuations in cash movements. The lower control limit defines the minimum cash balance and the difference between the lower and upper limit depends on the transaction cost, interest rate and standard deviation. The Financial Manager can set the lower limit according to the firm’s liquidity requirements. The standard deviation can be derived from past data of net cash flows. Once the upper and lower limits are set, managerial attention is needed only when cash balance deviates from the limits. The action under each of these circumstances can be anticipated and planned in the beginning.

Stone (1983) improved Miller-Orr model by adopting a look-ahead forecast of cash flows when an upper or lower limit is hit to take into account the possibility that the
surplus or deficit of cash may naturally correct itself. If the upper control limit is reached, but is to be followed by cash outflow days that would bring the cash balance down to an acceptable level, then nothing is done. If instead the surplus cash would substantially remain that way, then cash is withdrawn to get the cash balance to a predetermined return point.

2.3 Relationship between Cash Cycle and Performance

Richards and Laughlin (1980) studied the cash conversion cycle of Martin Marietta Corporation for the period 1975 to 1978. The data showed that a more rapid recovery of operating cash expenditure was accompanied by an increasing proportion of current assets held in the most liquid form. An improving liquidity position coincided with a shorter and more certain cash conversion cycle. This inverse relationship exists because longer cash conversion cycle reduces the flexibility available for firms in managing their cash flows in the face of economic adversity. Increase in liquidity reserve means higher present value of net cash flows and the value of the firm.

Gitman et al. (1979) in an assessment of cash management practices study in the US sampled the top 150 and bottom 150 firms on the Fortune list of 1000 largest firms. The study established that the cash management policies involved establishing optimal levels of accounts payable, inventory and accounts receivable by considering the economic tradeoffs that exist with respect to them. The effectiveness of the firm in managing these accounts was evaluated by the length of its cash cycle. The results showed that the shorter the cycle the better the performance.
Seonen (1993) investigated the relationship between the net trading cycle as a measure of working capital and return on investments in the US firms. The results of the Chi-square test indicate a negative trade cycle and return on assets. Further, this inverse relationship was found different across industries depending on the type of industry. Jose et al. (1996) examined the relationship between aggressive working capital management and profitability of US firms using cash conversion cycle as a measure of management of working capital where a shorter CCC represents the aggressiveness of working capital management. The results of the study indicated a strong negative relationship between CCC and profitability indicating that more aggressive working capital is associated with higher profitability.

Pittglio, Rabin, Todd and McGrath (2000) studied the cash to cash cycle of more than 320 technology based companies in the US. The study showed that the best in class manufacturers typically have a 75 percent advantage in their cash cycle time compared with the median in the industry. Between 1996 and 1997 a typical company reduced cash cycle by 8 percent. Cash cycle time for best in class companies was less than 30 days, while median performer's cash cycle time was up to 100 days (MDM, 2000).

Gentry et al. (1990) in the weighted cash conversion model demonstrates that the length of the weighted CCC is inversely related to performance. The larger the payable weight, the greater the deferral of payments to the suppliers and the shorter the weighted cash conversion cycle, given the weighted operating cycle. Shin and Soenen (1998) studied 58985 firms, listed during the period 1975 to 1994 in the US.
and found a strong negative relationship between the length of the cash conversion cycle and profitability.

Deloof (2003) studied 1009 non-financial firms in Belgian for the period 1992 to 1996. The findings of his study showed a negative relationship between working capital management as measured by cash conversion cycle and corporate profitability. Lazaridis and Trfonidis (2006) studied a sample of 131 firms listed on the Athens Stock Exchange for the period 2001 to 2004 and found a statistically significant relationship between profitability, measured through gross operating profit and the cash conversion cycle. Largay and Stickney (1980) showed a strong link between CCC and performance when they reported that the bankruptcy of W.T. Grant, a nationwide chain of department stores, should have been anticipated because the corporation had been running a deficit cash flow from operations for eight of the last ten years of its corporate life.

2.4 Measures of Performance

Copeland, Weston and Shastri (2005) identified six performance measures based on: earnings, rates of return, an economic profit measure, expectations, DCF valuation and real options. Measures based on earnings determine the company's ability to withstand competition, adverse rising costs and falling prices or declining sales in the future (Ross et al., 1993). An example of earnings based measures is the earning per share (EPS). The earnings based measures suffer from every knock out criterion for example the EPS contains no balance sheet information and is short term in nature. Thus the earning based measures are not trading based performance measures. (Copeland et al., 2005)
Reese and Cool (1978) observed that the return on investment (ROI) is widely regarded as the most useful measure and ultimate test of business performance. It is used both as an objective of management and as a dependent criterion variable to evaluate the effects of various factors on performance. Jacobson (1987) found that the ROI does contain information about economic rate of return. He further observed that the ROI measure contains information that stock market participants deem important as to profit performance. As such it has a correspondence with a measure of economic rate of return.

Stewart (1991) defined an economic profit (EVA) as the spread between the return on invested capital (ROIC) and the weighted average cost of multiplied by the dollar amount of invested capital. The economic profit creatively links the firm’s accounting data to its stock market performance. EVA focus on the firm’s operating performance from the standpoint of its financiers, hence not a trading-based performance measure (Bacidore et al., 1997)

Copeland (2002) states that research by ‘Monitor Corporate Finance’ indicated that financial metrics such as earnings, earnings per share and EVA do not correlate with the total return to shareholders. He argued that the market expectations are a better measure of shareholders value. Expectations-based management uses the difference between actual and expected performance as a measure linked to the total return to shareholders. Kaplan (1983) observed that the discounted cash flow performance evaluation approach has desirable properties for aggregating deterministic cash flows occurring at different points in time but suffers from the danger of narrowly
interpreting the quantified data. The multi-period aspect of DCF is useful if used in conjunction with the short-term measures.

Real options analysis is a superset of DCF. Real options are used in decisions concerning whether to exit and re-enter a line of business, and certain aspects of mergers and acquisitions (Erickson, 1998). Copeland et al. (1994) classified real options into four categories: the option to abandon or sale an asset, the option to defer asset development, the option to expand or contract the sale of an asset and the option to switch project operations. The option pricing approach is used to value intangible assets like research and development (Myers, 1984).

Bacidore et al. (1997) observed that an appropriate performance measure gauges how the management strategy affects shareholder value as measured by the risk–adjusted return on invested capital. An appropriate measure must therefore incorporate the required rate of return on invested capital, accurately measure the amount of capital used by the company and correlate highly with the risk–adjusted rate of return earned by shareholders.

For purposes of this study performance was measured by the rate of return (Ri). The Ri was preferred because it focuses on the firm’s stock price performance and seeks to determine how much shareholders increase their wealth from one period to the next based on the dividends they receive and the appreciation in the firm’s stock price. This is consistent with the wealth maximization objective of the firm (Zairi, 1994).
In summary the literature review indicate that cash conversion cycle is increasingly replacing the traditional current ratio and quick ratio as an indicator of firm's liquidity (Emery, 1994; Gallinger, 1997; and Soenen, 1998). Further the findings show an inverse relationship between performance and cash conversion cycle. A shorter cash conversion cycle is desirable as is associated with better performance, whereas a longer CCC is discouraged as it infers poor performance. The previous studies are limited because the environment is relatively different from Kenya as far as technology, firms' size and level of business and liquidity risks are concerned. This indeed leaves a gap in the studies to specifically establish whether the Kenyan economy show consistency in findings.
3.1 Introduction

This chapter discusses the research design, the population, the sampling, and the data analysis methods. The chapter concludes by explaining the coefficient of correlation denoted as $r$ and the t-statistic test.

3.2 Research Design

This was a descriptive study to explain the relationship between cash conversion cycle (CCC) and rate of return (Ri). Cooper and Schindler (2008) define descriptive studies as those studies whose objective is to explain a phenomenon, to estimate a proportion of a population with similar characteristics and to discover association among different variables. The main research variables were the CCC and Ri of the selected companies listed in the NSE for the five years period ending 31st December 2010. The descriptive approach was preferred because the study was to establish the association between cash conversion cycle and financial performance without explaining the causes of the association. This is consistent with other studies that have successfully used the descriptive design such as Deloof (2003), Soenen (1993), Jose et al. (1996) and Richards and Laughlin (1980). For instance Deloof (2003) studied the relationship between working capital management and corporate profitability by investigating financial statements of a sample of 1009 large Belgium non-financial firms for the period 1992-1996. Soenen (1993) investigated the relationship between the net trading cycle as a measure of working capital and return on investment in the
US firms. The study used the same approach by investigating the financial statements of a sample of 30 firms listed at the NSE for the period 2006 to 2010.

3.3 Population of the Study

The population of the study comprised all the 47 companies listed at the NSE as at 31 December 2010.

3.4 Sampling

The sample consisted of thirty companies continuously listed and actively trading in the NSE during the period 1st January 2006 to 31 December 2010. Judgmental sampling was used to select the companies. The sample excluded two suspended companies namely; Uchumi supermarket and Hutchings Biemer ltd (NSE, 2010) and included all the other companies in the categories: Agricultural, Commercial and Services, and Industrial and Allied. A forth category: Finance and investment that comprised 15 firms, was excluded. Finance and investment institutions play the role of financial intermediation and their cash policies are regulated by the central bank. Therefore unlike other commercial enterprises cash holding has a different purpose.

3.5 Data Collection

The study used secondary data extracted from the financial statements of the selected companies for the period 2006 to 2010. The annual financial statements were obtained from the NSE. Data collection forms were used to extract the following information: stock prices, dividend earned receivables, cost of goods sold, payables, sales and inventory.
3.6 Data Analysis Techniques.

Descriptive statistics were used to summarize the data and the correlation model to explain and interpret the association. The statistical package of the social science (SPSS 17) for windows and Ms excel sheets was used to analyze the data. A descriptive analysis of the summary statistics of each variable was conducted. Bivariate correlation analysis measured the degree of association between the length of the CCC and Ri. The Pearson’s correlation coefficient (r) was computed and a t-test conducted.

The correlation coefficients revealed the magnitude and direction of the relationship. The magnitude is the degree to which variables move in unison or opposition. The sign has nothing to do with the size of the correlation but signifies the direction of the relationship. The direction indicates whether large values on one variable are associated with large values on the other or small value with small value. If the values of CCC and Ri correspond that way, the variables have a positive relationship. On the other hand if an increase or decrease in the values of CCC is associated with a decrease or increase in the values of Ri, correlation is negative. If the values of CCC are not associated with the values of Ri then there is no correlation (Cooper & Schindler, 2008). The t-test results explained the significance of the relationship.
CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the data analysis and findings of the research. The study sought to answer the question: What is the relationship between cash conversion cycle and financial performance of companies listed in the NSE. The study covered the period 2006 to 2010. A sample of 30 companies was selected from three sectors: industrial & allied, commercial and services and agricultural. Data collection forms were used to extract the numbers for calculating the CCC and Ri from the financial statements of each company. The CCC and Ri were summarized in Ms excel sheets and the Statistical package of the Social Sciences (SPSS 17) for windows used to analyze the data. Frequencies and percentages were used to display the results which were presented in tables. Descriptive and correlation analysis explained the results.

4.2 Descriptive Analysis

A descriptive analysis of the cash conversion cycle and rate of return summary statistics for each of the five years was conducted. In each case a t-test was conducted and the following statistics produced: mean difference, standard mean error, standard deviation, t-value and associated degrees of freedom (df), and the P-value. The obtained statistics were tabulated in a table and interpreted. The cash conversion cycle was calculated as \{(Receivable collection period + Inventory conversion period - Payable deferral period)\}, whereas the rate of return was computed as \{(Stock price at the end of year t (P_{t}) - Current stock price (P_{0}) + Dividend paid end of year t (D_{t})\}/
Current stock price \( (P_0) \times 100\% \). The results are presented in tables 4.1 & 4.2 and figures 4.1 & 4.2 below.

**Table 4.1: Summary statistics of rate of return**

<table>
<thead>
<tr>
<th></th>
<th>t</th>
<th>Std. Deviation</th>
<th>Std. Error</th>
<th>Sig. (1-tailed)</th>
<th>Mean Difference</th>
<th>Lower</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>2.936</td>
<td>.80817</td>
<td>.14755</td>
<td>.006</td>
<td>.43319</td>
<td>.1314</td>
<td>.7350</td>
</tr>
<tr>
<td>2009</td>
<td>-1.582</td>
<td>.33147</td>
<td>.06052</td>
<td>.124</td>
<td>-.09576</td>
<td>-.2195</td>
<td>.0280</td>
</tr>
<tr>
<td>2008</td>
<td>-3.913</td>
<td>.25918</td>
<td>.04732</td>
<td>.001</td>
<td>-.18516</td>
<td>-.2819</td>
<td>-.0884</td>
</tr>
<tr>
<td>2007</td>
<td>.378</td>
<td>.51959</td>
<td>.09486</td>
<td>.708</td>
<td>.03582</td>
<td>-.1582</td>
<td>.2298</td>
</tr>
<tr>
<td>2006</td>
<td>3.122</td>
<td>.70005</td>
<td>.12781</td>
<td>.004</td>
<td>.39899</td>
<td>.1376</td>
<td>.6604</td>
</tr>
</tbody>
</table>

Source: Research findings, 2011

The study found that the mean value of the rate of return was low in the range of -0.18516 to 0.43319, indicating that most of the firms had realized low returns with some posting negative returns. The standard deviation was also found low ranging between 0.25918 and 0.80817 and in three out of five years ranged between 0.51959 and 0.80817. This showed that the performance of most firms was relatively the same. 2008 had the lowest standard deviation of 0.25918 which means that there was less variation in earnings compared to 2010 which had the highest standard deviation of 0.80817.
Figure 4.1 plots the mean returns for the period 2006 to 2010. On the Y axis is the mean returns and the period on the X axis. The graph shows a declining trend from 2006 to 2008. The mean return shifts upwards in 2009 increasing to a high of 0.43319 in 2010.
<table>
<thead>
<tr>
<th>Year</th>
<th>t</th>
<th>Std. Deviation</th>
<th>Std. Error</th>
<th>Mean</th>
<th>Sig. (1-tailed)</th>
<th>Mean Difference</th>
<th>Lower</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>12.025</td>
<td>17.14137</td>
<td>3.12957</td>
<td>.000</td>
<td>37.63333</td>
<td>31.2326</td>
<td>44.0340</td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td>11.285</td>
<td>15.98476</td>
<td>2.91841</td>
<td>.000</td>
<td>32.93333</td>
<td>26.9645</td>
<td>38.9021</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>10.393</td>
<td>19.79844</td>
<td>3.61468</td>
<td>.000</td>
<td>37.56667</td>
<td>30.1738</td>
<td>44.9595</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>9.666</td>
<td>23.44102</td>
<td>4.27973</td>
<td>.000</td>
<td>41.36667</td>
<td>32.6136</td>
<td>50.1197</td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>9.963</td>
<td>25.17990</td>
<td>4.59720</td>
<td>.000</td>
<td>45.80000</td>
<td>36.3977</td>
<td>55.2023</td>
<td></td>
</tr>
</tbody>
</table>

Source: Research findings, 2011

The mean value for cash conversion cycle was found to be high ranging between 32.93333 to 45.8. This was seen as one of the reasons for low firm performance as evidenced by low mean rate of return found in table 4.1 above. On average it takes about 37 to 45 days to convert the cash invested in raw material inventories into cash from collection of sales of finished goods. From a conceptual and theoretical perspective this is a relatively long CCC for good performance. Most studies such as Lazaridis and Trfonidis (2006), Richards and Laughlin (1980) and, Soenen (1993) recommend shorter CCCs. The standard deviation was found high ranging between 15.98476 and 25.1799, indicating that most of the firms had varied cash conversion cycles. The highest standard deviations, 25.1799 and 23.44 were realized in 2007 &
2006 respectively and during the same time the highest cash conversion cycles, 41 and 45 days were recorded. This means that the variation increased with the length of the cash conversion cycle.

**Figure 4.2: Mean cash conversion cycle**

![Mean cash conversion cycle graph](image)

X axis = Year  
Y axis = Cash conversion cycle

Figure 4.2 plots the mean cash conversion cycles for all the companies. The longest average CCC is 45 days realized in 2006 and the shortest is 32 days recorded in 2009. This shows that the CCC declined progressively during the period 2006 to 2009. Suggesting that the financial performance improved during that period.
4.3 Correlation Analysis

Correlation analysis established the association between the cash conversion cycle and rate of return. The Pearson correlation coefficient - \( r \) was produced and revealed the magnitude and direction of the relationship. The magnitude is the degree to which variables move in unison or opposition direction. The sign signifies the direction of the relationship, indicating whether large values on one variable are associated with large values on the other or small value with small value. If the values of CCC and Ri correspond that way, the variables have a positive relationship. On the other hand if an increase or decrease in the values of CCC is associated with a decrease or increase in the values of Ri, correlation is negative. If the values of CCC are not associated with the values of Ri then there is no correlation. Correlation analysis was administered for each of the three sectors and all the sectors combined. The analysis results are shown in tables 4.3 to 4.6. Figures 4.3 to 4.7 explain graphically the annual relationship between CCC and Ri for all the firms.

<table>
<thead>
<tr>
<th>Table 4.3: Correlation analysis agricultural sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ri</td>
</tr>
<tr>
<td>Ri</td>
</tr>
<tr>
<td>Pearson Correlation</td>
</tr>
<tr>
<td>Sig. (1-tailed)</td>
</tr>
<tr>
<td>N</td>
</tr>
</tbody>
</table>

Source: Research findings, 2011

Table 4.3 summarizes the correlation analysis results of firms in the agricultural sector. The results portray a negative relationship between cash conversion cycle and...
rate of return as shown by the correlation coefficient of -0.329. This association was found to be statistically significant at level 0.121.

Table 4.4: Correlation analysis commercial and services sector

<table>
<thead>
<tr>
<th></th>
<th>Ri</th>
<th>CCC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ri</td>
<td>Pearson Correlation</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Sig. (1-tailed)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>50</td>
</tr>
<tr>
<td>CCC</td>
<td>Pearson Correlation</td>
<td>-0.157</td>
</tr>
<tr>
<td></td>
<td>Sig. (1-tailed)</td>
<td>0.109</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>50</td>
</tr>
</tbody>
</table>

Source: Research findings, 2011

Table 4.4 shows the correlation analysis results of firms in the commercial and services sector. The results show a negative relationship between cash conversion cycle and rate of return with a correlation coefficient of -0.157. The results are statistically significant at level 0.109. This is consistent with findings in the agricultural sector.
### Table 4.5: Correlations Analysis for Industrial and Allied

<table>
<thead>
<tr>
<th></th>
<th>RI</th>
<th>CCC</th>
</tr>
</thead>
<tbody>
<tr>
<td>RI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>1</td>
<td>-.228</td>
</tr>
<tr>
<td>Sig. (1-tailed)</td>
<td>.125</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>85</td>
<td>85</td>
</tr>
<tr>
<td>CCC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>-.228</td>
<td>1</td>
</tr>
<tr>
<td>Sig. (1-tailed)</td>
<td>.125</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>85</td>
<td>85</td>
</tr>
</tbody>
</table>

Source: Research findings, 2011

Table 4.5 presents the correlation analysis results of firms in the industrial and allied sector. The results show a negative relationship between cash conversion cycle and rate of return. The correlation coefficient is -0.228, and is statistically significant at level 0.125. The results are consistent with findings in the agricultural and commercial and services sector.
Figure 4.3: Relationship between CCC and Ri in 2010

X axis = Rate of return
Y axis = Cash conversion cycle

Figure 4.4: Relationship between CCC and Ri in 2009

X axis = Rate of return
Y axis = Cash conversion cycle
Figure 4.5: Relationship between CCC and Ri in 2008

X axis = Rate of return
Y axis = Cash conversion cycle

Figure 4.6: Relationship between CCC and Ri in 2007

X axis = Rate of return
Y axis = Cash conversion cycle
Figures 4.3 to 4.7 plots the cash conversion cycle against the rate of return for each year from 2010 to 2006 respectively. On the Y axis is the CCC and Ri on the X axis. The graphs show a modest linear association between CCC and Ri. This relationship can be described by a straight line passing through the data cloud. The graphs slope from the upper left to the lower right of each X-Y plot. This represents different magnitudes of negative relationships. This signifies that as the length of the CCC shortens, the financial performance improves.
Table 4.6: Correlation analysis all sectors combined (2006-2010)

<table>
<thead>
<tr>
<th></th>
<th>CCC</th>
<th>Ri</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCCC</td>
<td>Pearson Correlation</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td></td>
<td>150</td>
</tr>
<tr>
<td>Ri</td>
<td>Pearson Correlation</td>
<td>-0.202</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.976</td>
</tr>
<tr>
<td>N</td>
<td></td>
<td>150</td>
</tr>
</tbody>
</table>

Source: Research findings, 2011

Table 4.6 presents the correlation analysis results of all the companies studied for the five years. The results show a negative relationship between cash conversion cycle and rate of return. The correlation coefficient is -0.202 and the results are statistically significant at level 0.976. The results are consistent with findings in each sector. However the inverse relationship is more exhibited in the agricultural sector with a correlation coefficient of -0.329 and less in the commercial and services sector with a correlation coefficient of -0.157. This affirms the low returns realized by firms in the agricultural sector. The findings are consistent with studies such as Richards and Laughlin (1980), Gitman et al. (1970), Gentry et al. (1990) and Seonen (1993).
CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter summarizes the conclusions and observations drawn from the data analysis, highlights the limitations of the study and makes recommendations for further research. The objective of the study was to establish the relationship between cash conversion cycle and financial performance of companies listed at the NSE.

5.2 Summary of Findings

The study used data collection forms to extract data from financial statements of the sample companies. The data was summarized in Ms excel sheets and the variables cash conversion cycle and rate of return computed. The data was further processed by the Statistical package of the social science (SPSS 17) for windows. Summary statistics: the mean, standard deviation, t-value together with the associated degrees of freedom (df) and the P-values were produced. Descriptive and correlation analysis was carried out and the Pearson correlation coefficient calculated.

The study found that the t-statistic for the rate of return ranged between -3.913 and 3.122. The rate of return t-statistics for 2010, 2008 and 2006 were found to be statistically significant because their p-values at 0.006, 0.001 and 0.004 respectively were less than 0.05. The mean value of the rate of return was however found to be low in the range of -0.18516 and 0.43319. This indicates that most of the firms had
posted relatively low results, which could be attributed to the long cash conversion cycles recorded. The t-statistic of the cash conversion cycle revolved around 10 at a statistical significance level of 0.00. All the CCCs t-values were found to be statistically significant because their p-values were less than 0.05. The average cash conversion cycle was 37 to 45 days. Conceptual and empirical research generally supports reasonably short cash conversion cycles for good performance. Gentry et al. (1990) and Shin and Soenen (1998) recommend shorter CCCs. Pittglio, Rabin, Todd and McGrath (2000) argue that the best in class companies have a CCC of less than 30 days. This suggests that with an average CCC of 37 to 45 days, firms in the NSE performed poorly. It seems plausible that the relatively long CCC may be a significant factor driving the low performance findings in this study.

The correlation analysis of cash conversion cycle and rate of return for the three sectors depicted a negative relationship. The correlation coefficients realized were -0.329, -0.228 and -0.157 for agricultural, industrial and allied and commercial and services sectors respectively, suggesting that the inverse association was more pronounced in the agricultural sector. The findings are consistent with studies such as Jose et al. (1996) who found a strong negative relationship between CCC and profitability. Gentry et al. (1990) in the weighted cash conversion model found that the length of the weighted CCC is inversely related to performance. Lazaridis and Trfonidis (2006) found a statistically negative relationship between profitability and the cash conversion cycle. Richards and Laughlin (1980) found that an improving liquidity position coincided with a shorter and more certain cash conversion cycle. Gitman et al. (1979) showed that the shorter the cycle the better the performance.
5.3 Conclusion

The study found a negative relationship between cash conversion cycle and firm performance. This supports previous studies such as Richards and Laughlin (1980) and Gentry et al. (1990). Because of the close association between cash conversion cycle and stock returns, the CCC can be used as a measure of performance. On firm level the stronger the correlation of CCC with stock returns, the stronger the validity of the CCC as a measure of firm performance. On the economic level the CCC measure contains information that stock market participants deem important as to profit performance, as such it has a correspondence with a measure of economic rate of return.

The findings further show that most of the firms had long cash conversion cycles ranging between 37 to 45 days. Conceptual and theoretical research generally supports fairly short CCCs of less than 30 days for good performance (Pittglio, Rabin, Todd and McGrath, 2000). The study suggests that the length of the cash conversion cycle had a significant effect on the firms’ low performance. The length of cash conversion cycle shows the net time interval between actual cash expenditures for purchase of productive resources and the ultimate collection of receipts from product sales (Lancaster and Stevens, 1996). A long CCC depicts weak average cash position, indicating that most of the firms operated with vulnerable cash balances.

5.4 Recommendations

The cash conversion cycle metric is of great value to business because it bridges across all the organization activities. However to use this metric effectively users must understand what comprises the CCC metric and be aware of the many leverage
points available for improving performance (Farris and Hutchison, 2002). An understanding of how the components of the cash conversion cycle: the receivables period, the inventory conversion period and the payables deferral period, interact would enable firms to control their operations effectively. Moss and Stine (1993) argue that a company with a long cash conversion cycle is more likely to seek external financing. Therefore to reduce the threat of debt firms should work towards reducing the cash conversion cycle.

The close association between cash conversion cycle and stock returns indicates that firm valuation is also closely related to the CCC. To improve firm value therefore a shorter cash conversion cycle is recommended. A shorter cash conversion cycle implies that cash is not tied up in working capital (Soenen, 1993). There are three primary leverage points to manage cash conversion cycle: extend average accounts payable, shorten production cycle to reduce inventory days of supply and reduce average accounts receivable. The study recommends that managers of these points must work closely for the success of the process.

5.5 Limitations of the Study

By and large the study was successful. However there were inherent limitations arising from pitfalls associated with the source of the data and the sampling process. Wagacha (2001) argues that the NSE is efficient in the weak form level thus the data suffers from the inefficiencies of weak form efficient markets. Security prices in weak form level markets have been found to exhibit no dependencies over time, at least down to the level of transaction costs. Transaction costs vary significantly over time thereby inhibiting fair year to year comparability of security prices and returns.
Another interesting pattern in stock prices that limits the rate of return used in the study is the so called year end effect. The study used end of the year data, and studies such as Branch (1977) and Keim (1983) have shown that stock returns decline in December of each year, especially for small firms and for firms whose prices had already declined during the year.

The study suffers from sample selection and survivorship bias. The sample included only those companies that survived during the period 2006 to 2010 thus ignoring companies that ceased to exist or were inactive. Such companies probably had lower returns that could have influenced the realized rate of return and failure to include them in the sample implies upward biased results. The study used an aggregated mean of the returns of all the selected companies stocks without isolating unique stocks like the ones that split. Usually stocks that split will always show positive abnormal returns prior to the split announcement date. Failure to isolate such stocks exposed the sample mean to inappropriate portfolio weights.

In selecting the sample the process assumed perfect market conditions while that may not be the case as certain micro-economic factors such as the existence of legislation that requires prices of some stocks to be fixed affect stock returns. Finally there is little distinction between statistical and economic significance in the study observations. Most of the observations were on statistical basis largely the t-statistic and p- values. Both statistical and economic proof is important in drawing study conclusions.
5.6 Areas of Further Research

The findings of this study add to the existing conceptual and empirical evidence that the cash conversion cycle is negatively associated with firm performance. However, additional studies that examine the relationship of the cash conversion cycle and other firm functions like supply chain is worth undertaking. The calculation of the cash conversion cycle is not precise and the methods used are as varied as the different definitions adapted. For example, Gentry et al. (1990) proposed a weighted cash conversion cycle, while Gallinger (1997) uses the operating cycle as the primary criteria to compute the CCC. A study to find out a more precise method of computing the cash conversion cycle is recommended.

There is little basis of deciding an appropriate cash conversion cycle especially across industries. A study to find out what would be a target cash conversion cycle based on factors such as industry, product value and size of the firm is appropriate. Further research may address the leverage points. It would be important to find out for example how far average receivables can be reduced without adversely infringing other leverage points or derailing other processes.

5.7 Implication on Policy and Practice

The findings of the study offer several insights to managers of commercial enterprises. Specifically the results suggest that managers should exercise caution in managing the cash conversion cycle because it touches on all aspects of the organization activities. The cash conversion cycle is important from an accounting and supply chain perspective. For accounting purposes the CCC is used to measure
liquidity and for supply chain management activities it serves as a measurement bridging the processes into and out of the firm (Farris and Hutchison, 2002).

The cash conversion cycle is a key performance driver that managers use to evaluate changes in working capital and thereby assist in the monitoring and control of its components namely: accounts payable, inventory and payables. Considering the uncertainty surrounding external funding proper management of the cash conversion cycle keeps an organization free from the challenges of external borrowing. A shorter cash conversion cycle implies that cash is not held up in working capital resulting in more liquidity for the firm (Soenen, 1993). Therefore in practice policy makers at all levels should implement policies that encourage a short cash conversion cycle. Schilling (1996) argues that a company’s optimum liquidity position, the minimum level of liquidity necessary to support a given level of business activity, must be identified and regularly assessed.
REFERENCES


Capital Markets Authority Act, Chapter 485A laws of Kenya.


APPENDIX I

COMANIES LISTED AT THE NAIROBI STOCK EXCHANGE AS AT 31 DECEMBER 2010

Agriculture
1. Rea Vipingo.
2. Sasini Tea & Coffee Ltd.
3. Kakuzi Ltd.

Commercial Services
2. Marshals E.A Ltd.
3. Car & General Ltd.
4. Hutchings Beemer Ltd. Suspended
5. Kenya Airways Ltd.
6. CMC Holdings Ltd.
7. Uchumi Supermarkets Ltd. Suspended
9. TPS (Serena) Ltd.
10. ScanGroup Ltd.
11. Standard Group Ltd.
12. Safaricom.

Finance and Investment
1. Barclays Bank of Kenya Ltd.
2. CFC Stannic Bank Ltd.
3. Housing Finance Ltd.
4. Centum Investment Ltd.
5. Kenya Commercial Bank Ltd.
7. Pan Africa Insurance Holdings Co. Ltd.
10. Standard Chartered Bank Ltd.
11. NIC Bank Ltd.
12. Equity Bank Ltd.
13. Olympia Capital Holdings Ltd.
15. Kenya Re-Insurance Ltd.

**Industrial and Allied**

1. Athi River Mining Ltd.
2. BOC Kenya Ltd.
4. Carbacid Investments Ltd.
5. E.A. Cables Ltd.
6. E.A. Breweries Ltd.
7. Sameer Africa Ltd.
8. Kenya Oil Ltd.
9. Mumias Sugar Company Ltd.
10. Unga Group Ltd.
11. Bamburi Cement Ltd.
12. Crown Berger (K) Ltd.
13. E.A Portland and Cement Co. Ltd
15. Total Kenya Ltd.
16. Eveready East Africa Ltd.
17. Kengen Ltd.
APPENDIX II

Data Collection Form

Name of company: -----------------------------------------------

Year: -----------------------------------------------

<table>
<thead>
<tr>
<th>Variable</th>
<th>Source</th>
<th>Value (kshs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of goods sold</td>
<td>Profit &amp; Loss Statement</td>
<td></td>
</tr>
<tr>
<td>Inventory</td>
<td>Balance Sheet Statement</td>
<td></td>
</tr>
<tr>
<td>Receivables</td>
<td>Balance Sheet Statement</td>
<td></td>
</tr>
<tr>
<td>Payables</td>
<td>Balance Sheet Statement</td>
<td></td>
</tr>
<tr>
<td>Dividend earned</td>
<td>Profit &amp; Loss Statement</td>
<td></td>
</tr>
<tr>
<td>Stock price</td>
<td>Profit &amp; Loss Statement</td>
<td></td>
</tr>
<tr>
<td>Sales</td>
<td>Profit &amp; Loss Statement</td>
<td></td>
</tr>
</tbody>
</table>

Completed by:

Name: -----------------------------------------------

Signed: ----------------------------------------------- Date: -----------------------------------------------
## APPENDIX III

**a) Average Returns**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Kakuzi</td>
<td>0.352</td>
<td>0.251</td>
<td>0.197</td>
<td>0.156</td>
<td>-0.102</td>
</tr>
<tr>
<td>Rea Vipigo</td>
<td>0.106</td>
<td>0.250</td>
<td>0.312</td>
<td>0.265</td>
<td>0.274</td>
</tr>
<tr>
<td>Sasini</td>
<td>0.232</td>
<td>0.140</td>
<td>0.275</td>
<td>-0.023</td>
<td>0.136</td>
</tr>
<tr>
<td>A. Bauman</td>
<td>-0.698</td>
<td>-1.583</td>
<td>-0.070</td>
<td>-0.015</td>
<td>-0.248</td>
</tr>
<tr>
<td>City Trust</td>
<td>0.228</td>
<td>0.281</td>
<td>0.170</td>
<td>0.134</td>
<td>0.108</td>
</tr>
<tr>
<td>Eaagda</td>
<td>0.422</td>
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<td>-0.015</td>
<td>0.045</td>
</tr>
<tr>
<td>Unga Group</td>
<td>-0.072</td>
<td>0.038</td>
<td>-0.107</td>
<td>0.259</td>
<td>0.259</td>
</tr>
<tr>
<td>Eveready</td>
<td>0.257</td>
<td>0.145</td>
<td>-0.161</td>
<td>-0.002</td>
<td>-0.022</td>
</tr>
<tr>
<td>Kenya Orchard</td>
<td>-0.406</td>
<td>-0.311</td>
<td>0.020</td>
<td>0.373</td>
<td>-0.915</td>
</tr>
<tr>
<td>Mumias sugar</td>
<td>1.017</td>
<td>0.797</td>
<td>0.356</td>
<td>0.054</td>
<td>0.173</td>
</tr>
<tr>
<td>Wtk</td>
<td>0.400</td>
<td>0.118</td>
<td>-0.059</td>
<td>0.083</td>
<td>-0.040</td>
</tr>
<tr>
<td>Car And General</td>
<td>0.260</td>
<td>0.259</td>
<td>0.321</td>
<td>0.325</td>
<td>0.308</td>
</tr>
<tr>
<td>Cmc</td>
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