THE RELATIONSHIP BETWEEN WORKING CAPITAL MANAGEMENT AND PROFITABILITY OF COMPANIES IN THE ELECTRIC POWER SUB-SECTOR IN KENYA.

BY

TERRY LUMBASI CHEPKANIA

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DECLARATION

This research proposal is my original work and has not been presented by any other university for degree award.

Signature_____   Date_____

TERRY LUMBASI CHEPKANIA

D61/61771/2010

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

Signature_____   Date_____

MARTIN ODIPO

LECTURER, SCHOOL OF BUSINESS

UNIVERSITY OF NAIROBI

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DEDICATION

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CCC   Cash Conversion Cycle

EOQ   Economic Order Quantity

ERC   Energy Regulatory Commission

ICP   Inventory conversion period

IPPs   Independent Power Producers

KenGen   Kenya Electricity Generation Company

KPLC   Kenya Power and Lighting Company Ltd

PDP   Payables Deferral Period

PPAs   Power Purchase Agreements

RCP   Receivables Collection period

WC   Working Capital

WCM   Working Capital Management

ANOVA   Analysis of Variance

ABSTRACT

This research project sought to establish the relationship between working capital management and profitability of companies in the electric power sub-sector in Kenya. The research project covered the conceptual and empirical analysis of companies in the electric power sub-sector responsible for generation, transmission and distribution of electrical energy in Kenya. A total of six companies responded from the year 2008-2013 financial years. Components of working capital such as cash conversion cycle, average inventory period, average payment period and average collection period were examined and how each of these variables relate with profitability measured by the gross operating margin. The study also included control variables such as debt ratio, current ratio and size of the firm. The study was analysed using descriptive statistics, Pearson's correlation coefficient and multiple linear regression models. The study established that the average collection period was negatively related to profitability of firms in the electric power sub-sector in Kenya. This implies that managers can create value for their firms by reducing the number of days in collecting receivables. The other variables like average inventory period, cash conversion cycle and average payment period were positively related to profitability. The average inventory period was positively related to profitability implying that management of firms need to increase inventory to avoid stock-outs to ensure difficulties of procuring materials to meet customer demands are minimised. The average payment period was positively significant in relation to profitability meaning that management should delay payment of suppliers to have enough cash to buy more inventory and increase sales hence improved profitability. It is a positive venture, as long as this policy does not compromise the relationship between suppliers or creditors and the companies in the electric power sub-sector in Kenya. This leads to the conclusion that indeed working capital management is important in profitability of firms in the industry.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The relationship between working capital management and profitability has undergone several studies by scholars producing different results. Some of the studies postulated an optimal way policy with regard to inventory, accounts receivables to maximize profits (Gill, Biger, & Mathur, 2010). Working capital management has both positive and negative impact on profitability which in turn affects the shareholders wealth (Gill et al., 2010).

According to Pandey (2005), large holding of current assets, especially cash, strengthens the liquidity position of the firm and reduces risk but at the expense of overall profitability. Therefore, a risk-return trade-off is involved in holding current assets. He also argues that it is only current assets that can be adjusted with sales fluctuations. The goal of working capital management is to achieve satisfying liquidity position, profitability and shareholders' value (Makori & Jagongo, 2013). Working capital is determined by the nature of business, market and demand conditions, technology and manufacturing policy and credit policy. Other factors determining working capital include: availability of credit from suppliers, operating efficiency and price level changes (Pandey, 2005).

Working capital management is critical to all firms but particularly important to small firms. Small firms may not have much investment in fixed assets but have to invest in current assets. Furthermore, small firms face receivables collection problems and normally face difficulties in long-term finances. The finance manager should determine the optimal levels of current assets and financing of the same. There is a direct link between firms' growth and working capital needs. As sales grow there is need for an increase in working capital. The

continual sales growth implies additional investment in fixed assets as well to match the expansion (Pandey, 2005).

1.1.1 Working Capital Management

Working capital management (WCM) is a process that involves planning and controlling current assets and liabilities in a manner that eliminates the risk of inability to meet short term obligations and avoid excessive investment in these assets (Eljelly, 2004; Lamberson, 1995).

Working capital management is considered a fundamental element of an organization's financial health as it aims at maintaining an optimal balance between each of the working capital components which are made up of the current assets and current liabilities (Lamberson, 1995).

According to Harris (2005) WCM is a simple and straight forward concept of ensuring the ability of the firm to fund the difference between the short term assets and short term liabilities. It describes the transition of a firm's ability to finance changes from cash to inventory to accounts receivables and back to cash. In addition, predicting cash flows, liquidity and risk are also important to financial managers as predictable businesses are dependable and attract better credit ratings, shareholders and consumers.

The goal of WCM of a firm is to ensure continuity of operations and sufficient cash flow to satisfy both maturing short-term debt and upcoming operational expenses (Brigham & Houston, 2004). Brigham and Houston (2004) stated that working capital (WC) is a financial metric which represents operating liquidity available to a business. Although it is a challenge for managers to make sure that the WCM business function is running in a well-organized and advantageous manner, there are chances of inequality of current assets and current

liability during this procedure. Firm's growth and profitability will be affected if this occurs and firm manager wouldn't be able to manage it efficiently (Brigham & Houston, 2004).

WCM is important because it ensures long-term success of an organization. No business can survive if it is unable to meet its day-to-day obligations. A business must develop clear policies with regard to working capital management to achieve a competitive advantage over its rivals (Makori&Jagongo, 2013). Working capital management can be considered as the management of cash, marketable securities, accounts receivable, inventories and account payables(Pandey,2005), summarized as follows: Cash management ensures that cash levels are maintained at a level so that the day to day expenses can be met and cash holding cost is low (Pandey,2005). Inventory management maintains quantity of inventory at such level so that production is not interrupted and at the same time too much money is not blocked in raw materials.

Debtors Management postulates that an appropriate credit policy should be adopted so that the credit term which attracts customers, such as the impact on cash flows and the cash conversion cycle will be offset by increased revenue and hence return on capital. The tools like discounts and allowances are used for this. Short term financing-inventory is normally financed by credit granted by suppliers and to finance other components of working capital other sources are needed as bank loans (or overdraft) or to convert debtors to cash through factoring (Ross, Westerfield & Jaffe, 2005).

1.1.2 Profitability

Mathur(2010) argues that gross profit is profit before selling, general and administrative costs, like depreciation and interest; it is the sales less direct cost of goods (or services) sold (COGS) while net profit is the sales of the firm less costs like wages, rent, fuel, raw

materials, interest on loans and depreciation. Costs such as depreciation and amortization tend to be ambiguous (Kithii, 2008).

There are two ratios of profitability in general: profitability related to sales and profitability related to investment.

It should be noted that profit is measured in different ways. However for the purposes of this study the gross profit margin was utilised. Pandey (2005) defines gross profit margin as sales less cost of sales as a ratio of sales.

Gross profit margin $=\dfrac{Sales - Cost\ of\ sales}{sales}$

$$=\dfrac{Gross\ profit}{sales}$$

A high profit margin relative to industry average reflects firm's ability to produce at relatively lower cost. This is achieved by higher sales price while costs of goods remain constant. Lower cost of sales with constant sales prices and or a proportionate increase in volume of higher margins items may also increase the profit margin.

A low profit margin implies higher cost of sales as a result of purchasing raw materials at high prices, inefficient and over-investment in utilisation of machinery and plant. It can also be a result of a general fall in market prices or firm's deliberate reduction in sales prices to increase volume of sales as cost of sales remains constant.

1.1.3 The Relationship between Working Capital Management and Profitability.

A series of studies have been carried out globally to establish the relationship between WCM and profitability. Empirical evidence has shown that indeed there exist a significant relationship between working capital management and profitability. Researchers have approached working capital management in numerous ways. While some studied the impact of proper or optimal inventory management, others studied the management of accounts receivables trying to postulate an optimal way policy that leads to profit maximization.

According to Deloof (2003), the way that working capital is managed has a significant impact on profitability of firms. Such results indicate that there is a certain level of working capital requirement, which potentially maximizes returns, (Gill, Biger & Mathur, 2010).

Firms may have an optimal level of working capital that maximizes their value. Large inventory and generous trade credit policy may lead to high sales. The larger inventory also reduces the risk of a stock-out. Trade credit may stimulate sales because it allows a firm to access product quality before paying.

Another component of working capital is accounts payables. Raheman and Nasr (2007) state that delaying payment of accounts payable to suppliers allows firms to access the quality of bought products and can be inexpensive and flexible source of financing. On the other hand, delaying of such payables can be expensive if a firm is offered a discount for the early payment. By the same token, uncollected accounts receivables can lead to cash inflow problems for the firm,(Gill et al., 2010).Cash conversion cycle (C.C.C) is the time span between the expenditure for the purchases of raw materials and the collection of sales of

finished goods and is used as popular measure in working capital management,(Gill et al.,2010).

1.1.4 Firms in the Electric Power Sub-Sector in Kenya.

Little research has gone into finding out the drivers of profitability in the electric power sub-sector of the energy sector in Kenya. One of the key attributes of the Kenyan economy is the energy sector. The rising living standards have been largely attributed to inflation and high cost of electricity in Kenya. Investors have shied away from investing heavily due to high costs of production of goods and services as a result of the increasing electricity prices.

According to Departmental Committee on Energy, Communications and Information on the ownership and status of KPLC (2010), Kenya on commercial scale is dominated by petroleum and electricity which are the prime movers of the modern sector economy. Wood fuel provides energy needs of the traditional sector including rural communities and urban poor. At the national level, wood fuel and other biomass account for about 68% of the total primary energy consumption followed by petroleum at 22%, electricity at 9% and others including coal at about less than 1%. Solar energy is extensively used for drying and to some extent for heating and lighting.

Kenya's Vision 2030 aspires to pursue a macro-economic framework anchored on the availability of adequate, reliable and affordable energy. The Vision 2030 acknowledges that Kenya's energy costs are currently higher than those of her African competitors.
Thus in order to spur growth and encourage investors into the country, Kenya must choose to generate cost effective electricity and increase efficiency in energy consumption.

The current effective installed electric power capacity during normal hydrology is about 1360 MW against a suppressed peak demand of about 1113 MW. The major sources against the effective installed electric power capacity are as shown below:

1) Hydro   748 MW

2) Geothermal   167 MW

3) Oil fired thermal   401 MW

4) Co-generation(Mumias) 26 MW

5) Wind   5 MW

6) Off grid   13 MW

Source: Departmental Committee on Energy, Communications and Information on the ownership and status of KPLC (2010)

The electricity supply industry in Kenya is currently operating as single buyer model whereby KPLC purchases power in bulk from KenGen and six Independent Power

Producers (IPPs) in operation, through Power Purchase Agreements (PPAs) approved by Energy Regulatory Commission (ERC).

1.2 Research Problem.

Optimal working capital management would in essence help ease the burden of high costs of electricity by managing efficiently and effectively the current assets and current liabilities of firms in the electric power sub-sector. It minimises the need for companies to increase electricity prices by tapping into the effective management of working capital that would act as a source of funds and improve the firms' profitability. The high cost of electricity, inefficiency and ineffectiveness has led to a low percentage of connected population in Kenya. This has led to unemployment and low level of investment in various manufacturing industries which has been born out of this dilemma.

Working capital management has an effect on profitability of the firm. The way working capital is managed has a significant impact on profitability of firms, Deloof (2003).

Many scholars have conducted research on the relationship between working capital management and profitability and given mixed results. However, majority of the studies showed negative relationship between working capital management and profitability, Eljelly (2004), Padachi (2006) among others. Mullins (2011) argued by saying that rising electricity prices increase inflation in production costs which in turn affect the international competitiveness of a country's goods and services. This affects levels of exports and imports and consequently the scale of domestic production. Therefore changes in electricity prices not only impact inflation, foreign trade but also employment, output and aggregate external balance of payments.

In Kenya scholars have also undertaken similar studies and concentrated on companies listed on the Nairobi Securities Exchange undertaking many functions in the economy,Mathuva (2010),focused on the influence of working capital management on corporate profitability of firms listed at the Nairobi Securities Exchange.Omesa, Maniagi, Musiega and Makori (2013) examined the relationships between Working Capital Management and Corporate Performance of 20 manufacturing firms listed on the Nairobi securities exchange for 5 years from 2007-2011 was selected among others.

Having considered all these studies there seems to be no established variables for measuring working capital management and profitability and also little research has been carried out in the electric power sub-sector in Kenya. Hence this research addressed the relationship between working capital management and profitability in the electric power sub-sector in

Kenya.Is there a significant relationship between working capital management and profitability of companies in the electric power sub-sector in Kenya?

1.3 Objective of the Study

To determine the relationship between working capital management and profitability of companies in the electric power sub-sector in Kenya.

1.4 Value of the Study

This study informs financial managers in the electric power sub-sector to focus on significant WCM components that would improve efficiency, effectiveness and profitability of firms. In addition, it also minimises the need to increase electricity prices due to declining profits of the firms. This also helps to reduce operational costs as a result of inefficiency.

The burden on the exchequer of bailing out poorly performing firms would be reduced. Subsequently; it boosts investor confidence and enhance consumer protection against high costs of electricity. Investors are able to reduce production costs and hence improve production as well as investments thereby reducing unemployment in the overall economy based on information from the research.

This acts as a source of reference for future studies for students interested in working capital management. This study focused on companies in the electric power sub-sector in Kenya where little research has been carried out in relation to working capital management and profitability. Scholars keen on pursuing further studies in the energy sector are better equipped with knowledge from this research to handle diverse areas affecting the electric power sub- sector. The study also confirmed and supported studies conducted by previous scholars in relation to working capital management and profitability and therefore boosted the literature and theories developed by these scholars.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The literature review captured the various components of working capital management and they include inventory management, cash management, accounts receivable management and accounts payable management. It also explained the theories and empirical studies conducted in this area.

2.2 Theoretical Literature Review

2.2.1 Theory of Risk and Return.

According to the theory of risk and return, investments with more risk results into higher returns (Makori & Jagongo, 2013). This in essence implies that investors are risk-averse quite in agreement with one of the assumptions of portfolio theory (Pandey, 2005). Therefore, firms with high liquidity have low risk and profitability. Conversely, firms with low liquidity attract high risk with high profitability (Makori & Jagongo, 2013).

Pandey (2005) argues that firms would just make enough investments in current assets if exact forecasts of working capital needs were made. A larger investment in current assets under certainty means low rate of return because excess investment achieves low levels of return. A smaller investment in current assets leads to interrupted production and sales due frequent stock-outs and inability to meet short term obligations of the business. In addition; short-term financing is less expensive but bears greater risk than long-term financing.

2.2.2 Working Capital Policies

There are basically three policies of working capital, the conservative approach, the aggressive approach, and the moderate approach.

2.2.2.1 Conservative Approach

In this approach long-term capital is being used to finance all permanent assets requirements and also to meet some or all of the seasonal demands (Brigham &Houston, 2004; Pandey, 2005). The yield curve is normally upward sloping; the cost of long term debt generally is more costly than short term debt. The long term debt also takes long time to secure the contracts and has many restrictions especially trading partners and entry into contracts with new suppliers (Brigham &Houston, 2004). Conservative policy means lower return and risk (Pandey, 2005).

Hence securing long term finance to curb inventory stock outs will be a problem. In case, suppliers of inventory are forbidden to trade with the company, there will be prolonged seasons of stock-outs while scouting for other suppliers to fill the void. However, long term debt avoids potential renewal problems; seeking for additional funds to pay for the loan with the same funds supplier (Brigham & Houston, 2004).

Financing short-term requirements with long-term debts necessitates payment of interest for use of funds even when they were not needed (Van Horne, 1986).According to the liquidity preference theory, it says that since lenders are risk averse, and the risk generally increases with the length of lending time, most lenders would prefer to make short-term loans (Pandey,2005). A conservative working capital policy, combines high level of current assets with high level of long-term financing and not risky at all but would be less profitable (Pandey, 2005)

2.2.2.2 Aggressive Approach

In this approach, the company finances all of its fixed assets with long term capital but part of its permanent current assets with short-term credit (Pandey, 2005). A company that uses more short-term source of finance and less long-term source of finance will incur less cost but with a corresponding high risk. This has the effect of increasing its profitability but with a potential risk of facing liquidity problem should such short-term source of finance be withdrawn or renewed on unfavourable terms (Brigham & Ehrhardt, 2011). This policy combine low level of current assets with low level of long-term financing (high level of short-term financing) and will have high profitability (return) and high risk (Pandey, 2005).

2.2.2.3 Moderate Approach

This strategy minimizes the risk that the company will be unable to pay off its matured obligations. This approach makes distinction between fluctuating current assets and permanent current assets with the suggestion that to finance working capital; short-term source of finance should be used to finance fluctuating current assets, whiles long-term source of finance should be used to finance permanent current assets (Brigham & Ehrhardt, 2011).

However, it is argued that it is not possible to determine whether short term debt or long term debt is better than the other. It depends on the firm's specific conditions to have a choice and also on the preference of managers (Brigham & Houston, 2004).In cases of mismatch especially expected date of sale of inventory to offset a loan will lead to extra costs and common equity does not have maturity date (Brigham & Houston, 2004).

It should be noted that exact matching is not possible due the uncertainty about expected lives of assets; short- term interest rates are more volatile than long-term interest rates and requires frequent refinancing (Ross, Westerfield&Jordan, 2007; Pandey, 2005).

2.3 Determinants of Profitability of Companies in the Electric Power Sub-Sector in Kenya.

There are many determinants specific to the Kenyan sub-sector that drives profitability. One of the key factor is exogenous shocks; currency devaluation in 1990's saw Kenya's currency depreciate by more than 300% and as a result the cost of investment went up for imports in terms of raw materials, tools and equipment, foreign exchange where the PPA's are effected in US dollar and, fuel imports,(Eberhard & Gratwick,2005).Drought conditions shrouds the prospect of reduced electricity generation which leads to reduced sales due to load shedding, accompanied by outages and disruption of power supply to consumers(Owino,2003). It also enshrines expensive proportion of thermal power introduced to plug the power deficiencies that eats into profitability of electric power companies in Kenya (Eberhard & Gratwick, 2005). War and civil unrest in the 2007/2008 post-election violence slowed down the economic growth of the country. The electric power infrastructure was also destroyed in the process. This led to reduced electricity sales as a result of reduced production and consumption of electricity.

The state of the economy has a great bearing on the financial performance of companies in the electric power sub-sector in Kenya. Generally, economic growth leads to increased economic activities and vibrant investment driving up the demand for electricity. As a consequence, an increased electricity sale reflected by an increase in revenue generated.

Kenya's investment climate was lackluster from 1990 to 2000 with GDP compound growth rate of 1.73%, (Eberhard & Gratwick, 2005).

Technical losses and commercial losses are critical determinants of the profitability of a corporation that transmits and distributes electric energy. KPLC had anticipated technical losses to drop from 16.4% to less than 15% through system reinforcements and capital intensive system upgrade but limited funds has hampered this level of development (Owino,2003). Low income levels of the rural Kenyan population and part of urban has reduced the demand for electricity. The coverage and expansion of the national grid in rural areas is also minimal and relatively expensive to connect and even operate. The commercial losses results from illegal connections, theft of power by consumers and vandalism of property and critical equipment in the system. Replacement of the equipment has new financing costs and affects the profitability of the electric power sub-sector.

The connection policy of the distributing company adversely affects its sales. The prohibitive connection charges reduce the rate of connectivity and consequently the electricity sales in rural areas (Owino, 2003). This is also propelled by the fact that most industries are concentrated within urban areas where the national grid coverage is relatively better compared to rural areas. The lower income levels also imply lower profits with high operational costs in rural areas. Many households in rural areas cannot afford to meet these charges due their levels of disposal income.

Unreliable, inadequate and poor quality of power due to frequent outages, legal redress and litigations, damage to equipment, delays in power restoration, reduce the revenues of the generating, transmitting and distributing companies due to lost sales. It also creates unconducive investment climate for investors and leads to unnecessary fines (Owino, 2003).

Government policy and regulation through retail and bulk tariff setting and review limits the industry players from making electricity price changes to realize profits. Hence the change in prices of materials, tools and equipment is not reflected in the relative price changes in cost of electricity production. The costs keep on fluctuating while the pricing of electricity is fixed affecting the revenue streams of the companies in the electric power sub-sector (ERC). Tariff reviews upwards also impact negatively on sales since electricity demand is sensitive to pricing (Mullins, 2011). Exported goods and services are relatively expensive in foreign markets while imports become relatively cheaper in South African market.

2.4 Empirical Literature

The trade-off between profitability and risk is the key to working capital management. Too little working capital increases profit but reduces liquidity, as current assets are more expensive than fixed assets. Ghosh and Maji (2003) made an attempt to examine the efficiency of working capital management of the Indian cement companies during 1992 – 1993 to 2001 – 2002. For measuring the efficiency of working capital management, performance, utilization, and overall efficiency indices were calculated instead of using some common working capital management ratios. 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.

The ultimate objective of any firm is to maximize its profit. However, preserving liquidity of the firm is an important objective as well. The problem is that increasing profits at the cost of liquidity can bring serious problems to the firm. Therefore, there must be a tradeoff between

these two objectives (liquidity and profitability) of firms. One objective should not be at the cost of the other because both have their own importance.

Padachi (2006) conducted a study to examine trends in working capital management and its impact on firms' performance for 58 Mauritian small manufacturing firms during 1998 to 2003. He performed his study by using different variables like return on assets as a dependent variable to measure profitability and account receivable ratio in number of days, account payable ratio in number of day, inventory turnover ratio in number of days, and cash conversion cycle as independent variables. Size (natural logarithm of sales), gearing ratio (financial debt/total assets), gross working capital turnover ratio (sales/current assets), current assets to total assets ratio are included in control variables. His study showed that the management of various components of working capital has a positive impact on profitability. His results also showed that high investment in receivables and inventory contributed to low profitability and displayed an increasing trend in short-term financing.

Singh and Pandey (2008) studied the working capital components and the impact of working capital management on profitability of Hindalco Industries Limited in India for period from 1990 to 2007. Results of the study showed that current ratio, liquid ratio, receivables turnover ratio and working capital to total assets ratio had statistically significant impact on the profitability of Hindalco Industries Limited. However, this study was limited to one particular industry and hence generalization of the findings to other industries would be a challenge.

Mathuva (2010) examined the influence of working capital management components on corporate profitability by using a sample of 30 firms listed on the Nairobi Stock Exchange (NSE) for the periods 1993 to 2008. The key findings of his study were that: (i) there exists a highly significant negative relationship between the time it takes for firms to collect cash from their customers (accounts collection period) and profitability, (ii) there exists a highly

significant positive relationship between the period taken to convert inventories into sales (the inventory conversion period) and profitability, and (iii) there exists a highly significant positive relationship between the time it takes the firm to pay its creditors (average payment period) and profitability.

Deloof (2003) challenged the effect of working capital management on Belgian firm's profitability. The study was conducted for a sample of 1,009 large Belgian non-financial firms for the period 1992-1996.The empirical results of his study concluded that the profitability can increase by reducing the length of the accounts receivable period and inventory conversion period. He also explained that less profitable firms wait longer to pay their bills. However, the results emphasized the importance of managing working capital efficiency to increase profitability.

Eljelly (2004) tested the relationship between profitability and liquidity measures for 27 Saudi companies, from three non-financial sectors, over the period 1996-2000. The independent variables used in the regression models as measures of liquidity were the current ratio and the CCC. Size was included as a control variable. The dependent variable was measured using net operating income before depreciation deflated by sales. The overall results showed that liquidity measures are significant and have negative relationship with profitability, and the importance of those measures differ across industries.

Raheman and Nasr (2007) studied the effects of selected working capital management and liquidity measures on the profitability of 94 Pakistani companies listed on Karachi Stock Exchange over the period 1999-2004. They ran pooled least squares and generalized least squares regression models with cross section weights to test the relationship between profitability; the dependent variable, measured as the net operating income deflated by total assets and the following independent variables; the RCP, the ICP, the PCP, the CCC, and the

current ratio. They have also used size, leverage, and the ratio of financial assets to total assets as control variables. The results showed significant and negative relationships between profitability and all WCM and liquidity measures. Furthermore, size showed a significant and positive relationship with profitability, leverage and the ratio of financial assets to total assets showed significant and negative sign with profitability.

According to Napompech (2012) the findings of his research in Thailand confirmed that only two actions can increase profitability: reducing the inventory conversion period by producing and selling goods faster and reducing the receivables collection period by accelerating collections. The primary purpose of his research was to examine the effects of working capital management on profitability. The regression analysis was based on a panel sample of 255 companies listed on the Stock Exchange of Thailand from 2007 through 2009.

The results of his study showed a significant negative relationship between firm profitability and the inventory conversion period and receivables collection period. This study also found an inverse relationship between the payables deferral period and profitability, which may be a result of less profitable firms taking longer to pay their suppliers (Napompech, 2012).

Gill, Biger and Mathur (2010) analysed the relationship between working capital management and profitability of 88 American firms listed on New York Stock Exchange for a period of 3 years from 2005 to 2007. They found statistically significant relationship between the cash conversion cycle and profitability, measured through gross operating profit. It follows that managers can create profits for their companies by handling correctly the cash conversion cycle and by keeping accounts receivables at an optimal level, (Gill,Biger,&Mathur,2010).

2.5 Summary of Literature Review

It is imperative to note variables used as proxies for measuring working capital management and profitability in the empirical studies are not specific and vary across firms, industries, and countries. The researchers also show that the working capital components do not depict a consistent, unidirectional relationship to profitability when tested in different countries, industries and firms across the world. This indicates that there must be other latent factors at play apart from effective working capital management that affect profitability of firms. They also show that working capital management and liquidity measures are important and significantly relate to profitability and differ across the globe.

These studies also have not formulated a standard analytical way of the relationship between working capital and profitability. In addition, little empirical study has been carried out relating working capital management and profitability of companies in the electric power sub-sector in Kenya. This study therefore attempted to fill these gaps by modelling the study on the relationship between working capital management and profitability in the electric power sub-sector in Kenya. The working capital management was measured by many variables (cash conversion cycle, average payables period, receivables payable period, average age inventory). Profit was measured through gross operating profit, net operating income before depreciation deflated by sales and net operating income deflated by total assets.

In their study research, most of them utilised the cash conversion cycle model in carrying out their studies. The relationship was examined using regression and correlation analysis. The researchers show that there is statistically significant relationship between working capital management and profitability.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The methodology constitutes the research design, population under study, the data collection process, the tools and instruments used for gathering data, and how data was analysed and presented. In order to derive the results, data was collected based on historical data retrieved from annual reports and financial statements from respective companies and also from the Nairobi Securities Exchange (NSE).

3.2 Research Design

Cross-sectional and longitudinal research design was used to carry out the research. Longitudinal research design was utilized emanating from the period of time taken in studying the variables (2008-2013).The main advantage of the design is that it allows researchers to assess the stability and continuity of several attributes of a sample by repeatedly observing the same participants (Kagan& Moss, 1962).In agreement with Mugenda and Mugenda(2003), cross-sectional designs are research designs in which different cohorts or individuals are tested at a given point in time. Cross-sectional designs are between-subjects designs. The primary advantage of cross-sectional designs is that they are very economical. Longitudinal designs are research designs in which a cohort is selected and studied over a relatively long period of time with repeated measurements. The same sample or group of individuals is studied overtime.

The data was analysed using descriptive statistics: the mean, variance and standard deviation as well as frequency distribution. In addition, inferential statistics: multiple linear regressions and Pearson's correlation was also used for data analysis.

3.3 Population

The population consisted of 10 companies directly involved in electricity generation, transmission and distribution and whose core business was electricity for the period of six years for the purpose of the study. The companies categorised as co-generation and other players in the energy sector responsible for policy formulation and licensing were excluded.

3.4 Data Collection

The data collected included recorded sales, cost of sales, total assets, accounts receivables, inventories, accounts payable, current assets, current liabilities and total debt. These data was collected from annual reports and financial statements of the respective 10 companies. Both the balance sheet and the income statement of each company were considered in a data tabulation form. In order to derive the results, data collected was based on historical data retrieved from annual reports and financial statements from respective companies, their websites, and 'investing in Africa' website and also from the NSE.

3.5 Data Analysis.

The first model tested the relationship between the average payment period (APP) and profitability.

$$GOP = \beta_0 + \beta_1 (APP) + \beta_2 (LOS) + \beta_3 (CR) + \beta_4 (DR) + \varepsilon$$

The second model tested the relationship between the average collection period (ACP) and profitability.

GOP = β0+ β1 (ACP) +β2 (LOS) + β3 (CR) + β4 (DR) + ε

The third model tested the relationship between the inventory turnover in days (IVID) to profitability.

GOP = β0+ β1 (IVID) +β2 (LOS) + β3 (CR) + β4 (DR) + ε

The fourth and last model tested the relationship between cash conversion cycle and profitability.

GOP = β0+ β1 (CCC) +β2 (LOS) + β3 (CR) + β4 (DR) + ε

Where,

GOP=Gross operating profit.

APP=Average payment period.

IVID=Inventory turnover in days.

CCC=Cash conversion cycle

ACP=Average collection period.

LOS=Size of the company.

CR= Current ratio.

DR=Debt ratio.

ε =Error term.

β0………β5=Regression model coefficient.

The data was analysed using multiple linear regression models and Pearson correlation and inferences made based on the same. The size of the firm (as natural logarithm of sales), current ratio and debt ratio were used as control variables. The Pearson's' correlation and regression analysis (pooled least squares) were used to analyse data. In this study four models were used to conduct research on the hypotheses (Mohammad, 2011).Cash conversion cycle

was calculated in this way ;(Inventory Turnover in Days+ Average Collection Period-Average Payment Period).Inventory turnover in days: Is the average time required to change materials into a product and sell. It was given by,

$$IVID=\frac{Average\ inventory*365}{Cost\ of\ sales}$$

Average collection period is the average time required for changing the firms'account receivables into cash.

It was given by,

$$ACP=\frac{Average\ receivable\ accounts*365}{Sales}$$

Average payment period is the average required time for a product bought on credit for payment to be effected.

It was given by,

$$APP=\frac{Average\ accounts\ payables*365}{Cost\ of\ sales}$$

Gross operating profit (GOP) is calculated as,

$$GOP=\frac{Sales-Cost\ of\ sales}{sales}$$

$$Current\ ratio=\frac{Current\ assets}{Current\ liabilities}$$

$$\text{Debt ratio} = \frac{Total\ assets - Total\ equity}{Total\ assets}$$

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

The variables data was captured from the respective companies' annual reports, NSE, their websites and 'investing in Africa' website. The data forms (appendix 6) were circulated to specific companies whose financial statements were not found on their websites, NSE and 'investing in Africa' website for African stock-markets listed companies in Kenya. The data was filled for the years 2008-2013 in the data forms for each company and average values calculated for the period. Ratio analysis (appendix 9) was performed on these values for each company and then entered in SPSS for analysis. The data collected from the sampled companies was tabulated and analysed using descriptive statistics, Pearson's correlation and multiple linear regressions. The results have been captured as per the analysis in this chapter. The four models were tested using the multiple linear regression and findings tabulated in tables as displayed below.

The models regressed the dependent variable GOP against the predictors, APP, ACP, IVID and CCC in the study analysis. Thereafter the results were analysed using the SPSS software to tabulate various values for the analysis. The data was discussed in detail regarding each model as per the general summary model, analysis of variance (ANOVA) and regression coefficients and the implications of the values.

4.2 Descriptive Statistics

In this analysis the tabulation sought to establish the minimum, maximum, mean and standard deviation of data collected for six companies. The findings were tabulated as shown in table 1.

TABLE 1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
GOP	6	-.408	.839	.29100	.409641
APP	6	64.664	3285.135	762.11017	1248.726022
ACP	6	50.655	336.114	140.02383	117.552843
IVID	6	.000	1794.158	366.16583	706.698070
CCC	6	-3050.331	1478.859	-255.92050	1490.354853
LOS	6	11.272	18.039	14.62550	2.442769
CR	6	1.027	5.993	2.26400	1.876661
DR	6	.053	1.037	.58600	.344622
Valid N (listwise)	6				

Source: 2008-2013 SPSS output data

Descriptive analysis gives a picture of the maximum, minimum, mean and standard deviation of the variables being studied. From table 1 above, it shows that the gross operating profit has a mean value of 29.1% with a standard deviation of 40.964%. The average payment period has a mean value of 762.110 days with a standard deviation of 1248.72 days from the mean.

The mean average collection period is 140.024 days with a standard deviation of 117.552 days. The inventory turnover in days has a mean of 366.166 with a standard deviation of 706.698 days. The cash conversion cycle has a mean value of -255.921 days and a standard deviation of 1490.354 days. It implies that the industry waits to sell the inventory it bought from suppliers before paying cash to the suppliers. Well, it may not work for suppliers who demand cash on delivery. It also implies that the company does not require inventory to keep the business running in the long run. The mean size of the industry is 14.626 with a standard deviation of 2.443 achieved by natural log of sales. The mean current ratio is 2.264 with a standard deviation of 1.877. The recommended value is 2 hence health for the industry. The debt ratio has a mean value of 58.6% and standard deviation of 34.46%.

4.3 Correlation Analysis

The variables were analysed using SPSS by use of the Pearson bivariate correlations to establish the correlations between the 8 variables indicated in table 2. From table 2, it shows that both ACP and DR have negative Pearson correlation coefficients. This shows that GOP is negatively related to ACP quite in agreement with the idea that the faster a company recoups its accounts receivables the higher the liquidity leading to increased investment in sales and consequently profitability,(Deloof,2003;Makori & Jagongo,2013).

TABLE 2: Pearson bivariate correlations coefficients

	GOP	APP	ACP	IVID	CCC	LOS	CR	DR
GOP	1							
APP	.192	1						
ACP	-.604	.499	1					
IVID	.548	-.181	-.144	1				
CCC	.051	-.884(*)	-.407	.614	1			
LOS	.242	-.301	-.314	.113	.281	1		
CR	.734	.013	-.226	.946(**)	.420	.067	1	
DR	-.760	.415	.794	-.685	-.610	-.121	-.742	1

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

 Listwise N=6

Source: 2008-2013 SPSS output data

Table 2 shows that GOP is positively related to APP, IVID, CCC, LOS and CR. The positive relationship between GOP and APP implies that the company delays payment to its suppliers and in so doing holds cash to enable it purchase more inventories for sales boosting profitability .The positive relationship between IVID and GOP indicates that firms which have high levels of inventory reduce stock-outs and minimise production interruptions and ordering costs and hence improve profitability (Makori & Jagongo, 2013).The CCC is positively correlated with GOP quite contrary to the popular believe by many scholars that a negative CCC is preferred over a positive one. All the variables in table 2 above are not significantly related profitability of the firms in the electric power sub-sector in Kenya. The ACP, IVID are moderately related to GOP while CR and DR are strongly related to GOP from table 2.

4.4 Regression analysis and Hypothesis Testing

This analysis involved the summary of each of the four models, ANOVA and then the regression coefficients. The four models have been numbered from 1 to 4 and each model is discussed independently and on its own. This does not imply isolation of the models in terms of analysis but gives a detailed discussion and better understanding of each model.

TABLE 3: Model 1- GOP against Average payment period (APP) Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.999(a)	.999	.994	.031282	.999	214.100	4	1	.051	2.165

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

Dependent Variable: GOP

TABLE 4: ANOVA for model 1

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.838	4	.210	214.100	.051(a)
	Residual	.001	1	.001		
	Total	.839	5			

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

Dependent Variable: GOP

Source: 2008-2013 SPSS output data

TABLE 5: Multiple linear Regression coefficients for model 1

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	.132	.107		1.239	.432	-1.223	1.487		
	APP	.000	.000	.781	16.845	.038	.000	.000	.543	1.843
	LOS	.058	.006	.348	9.620	.066	-.019	.135	.892	1.121
	CR	-.035	.013	-.162	-2.672	.228	-.203	.132	.319	3.136
	DR	-1.382	.079	-1.162	-17.535	.036	-2.383	-.380	.265	3.767

Dependent Variable: GOP

Source: 2008-2013 SPSS output data

The adjusted R square value implies that 99.4% of variability in profitability can be explained by the model.APP has a regression coefficient of zero hence a unit change in the variable does not have any change on GOP. The null hypothesis that there is no significant relationship between APP and GOP is rejected based on the p value of 0.038 which is lower than α=0.05 at 5% level of significance from table 4 (Saleemi, 2007).Hence, there is a significant relationship between APP and profitability in the electric power sub-sector in Kenya. There is absence of autocorrelation and multicollinearity with the highest Variance Inflation Factor (VIF) of 3.767 in model one. It only raises concern if the VIF value is above 10(Makori & Jagongo, 2013). The model is statistically marginally significant as shown by F-value of 214.10 and p value=0.051 which is slightly greater than α=0.05 table 3 (Saleemi, 2007).This implies that a further research with a large sample is required to discern the exact relationship of the two variables. The Durbin-Watson value is 2.165 within the acceptable

values from 1.75 to 2.25 with an ideal value of 2 indicating uncorrelated errors. The Durbin-Watson statistic normally ranges in value from 0 to 4.

TABLE 6: Model 2- GOP against Average Collection period (ACP) Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.985(a)	.971	.854	.156537	.971	8.310	4	1	.254	1.670

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

Dependent Variable: GOP

TABLE 7: ANOVA for model 2

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.815	4	.204	8.310	.254(a)
	Residual	.025	1	.025		
	Total	.839	5			

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

Dependent Variable: GOP

TABLE 8: Multiple linear regression coefficients for model 2

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	-1.008	.621		-1.624	.351	-8.897	6.881		
	ACP	-.010	.003	-2.873	-3.221	.192	-.050	.029	.037	27.240
	LOS	-.070	.042	-.419	-1.682	.342	-.602	.461	.469	2.130
	CR	.584	.165	2.676	3.543	.175	-1.511	2.679	.051	19.540
	DR	4.107	1.475	3.455	2.785	.219	-14.630	22.844	.019	52.696

Dependent Variable: GOP

Source: 2008-2013 SPSS output data

The models adjusted R explains 85.4% variability in profitability of the model. The ACP regression coefficient is negative implying a unit increase in ACP reduces the profitability by -0.010 in model 2. The ACP is statistically insignificant in relation to GOP as indicated by t=-3.221 and p value= 0.192 which is greater than $\alpha=0.05$ at 5% significance level from table 6 (Saleemi, 2007). The null hypothesis that there is no significant relationship between ACP and GOP is accepted. Hence, it is not a critical factor in decision making to improve profitability.

The model has an F-value of 8.31 and p value=0.254 greater than $\alpha=0.05$ hence the model is insignificant (Saleemi, 2007). The Durbin Watson value is 1.67 within the acceptable level of 1.5 to 2.5 showing non-autocorrelation from table 5. The highest VIF is 52.696 showing there is presence of multicollinearity because the value is greater than acceptable value of 10

(Makori & Jagongo,2013).

TABLE 9: Model 3 - GOP against Inventory turnover in days (IVID) Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics						Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change		
1	.939(a)	.881	.404	.316194	.881	1.848	4	1	.497		1.077

a Predictors: (Constant), DR, LOS, IVID, CR

b Dependent Variable: GOP

TABLE 10: ANOVA for model 3

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.739	4	.185	1.848	.497(a)
	Residual	.100	1	**.100**		
	Total	.839	5			

a Predictors: (Constant), DR, LOS, IVID, and CR

b Dependent Variable: GOP

Source: 2008-2013 SPSS output data

TABLE 11: Multiple linear regression coefficients for model 3

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	-.609	1.174		-.518	.696	-15.525	14.308		
	IVID	-.001	.001	-1.447	-1.337	.409	-.009	.007	.102	9.833
	LOS	.040	.059	.239	.679	.620	-.712	.792	.957	1.045
	CR	.393	.257	1.800	1.530	.368	-2.869	3.654	.086	11.606
	DR	-.460	.619	-.387	-.744	.593	-8.319	7.398	.440	2.272

Dependent Variable: GOP

Source: 2008-2013 SPSS output data

The adjusted R accounts for 40.4% variability in profitability of the model. The IVID has a negative coefficient implying a unit change in IVID reduces profitability by -0.001 values. The t-value of -1.337 and p value=0.409 which is greater than $\alpha=0.05$ at 5% significance level implying that the relationship between IVID and GOP is not significantly different from zero value. The null hypothesis that there is no significant relationship between IVID and GOP is accepted (Saleemi, 2007). When deciding on factors to consider in improving profitability it is not critical.

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The F value is 1.848 and p-value= 0.497 which is greater than α=0.05 hence the third model is statistically insignificant (Saleemi, 2007). The Durbin-Watson value of 1.077 shows positive autocorrelation. The highest value of VIF is 11.606 showing presence of multicollinearity.

TABLE 12: Model 4 - GOP against Cash conversion cycle (CCC)   Summary

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | | Durbin-Watson |
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.995(a)	.990	.951	.091058	.990	25.048	4	1	.149	1.933

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

b Dependent Variable: GOP

TABLE 13: ANOVA for model 4.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.831	4	.208	25.048	.149(a)
	Residual	.008	1	.008		
	Total	.839	5			

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

b Dependent Variable: GOP

TABLE 14: Multiple linear regression coefficients for model 4

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	-.065	.310		-.209	.869	-4.005	3.876		
	CCC	.000	.000	-.744	-5.710	.110	-.001	.000	.582	1.717
	LOS	.053	.017	.317	3.056	.201	-.168	.274	.916	1.091
	CR	.074	.032	.340	2.290	.262	-.338	.486	.447	2.235
	DR	-1.097	.202	-.923	-5.421	.116	-3.669	1.475	.341	2.934

a Dependent Variable: GOP

Source: 2008-2013 SPSS output data

The adjusted R square explains 95.1% variability in profitability of the model. The CCC has zero regression coefficient implying a unit increase in CCC has no effect on profitability of the firm and also is not significantly different from zero as shown by t value of -5.710 and p value= 0.11 which is greater than α=0.05 at 5% significance level from table 13 (Saleemi, 2007).This means we accept the null hypothesis which postulates that there is no significant relationship between CCC and GOP. The F-value of 25.048 and p-value= 0.149 which is

greater than $\alpha=0.05$ hence the model is statistically insignificant (Saleemi, 2007). The Durbin-Watson value of 1.933 implies there is absence of auto-correlation within the model (Greene, 2000; Wooldridge, 2000).The highest VIF value of 2.934 implies that there is absence of multicollinearity because a value of more than 10 raises concern(Makori and Jagongo,2013).

4.5 Discussion of Research Findings

The findings show that there is significant positive relationship between Average payment period (APP) and profitability in the electric power sub-sector in Kenya. This implies that management should delay payment of suppliers to increase liquidity in order to increase investments in business opportunities as well as inventory and meet short term obligations without difficulty hence increasing sales and profitability. However, this should be optimized to avoid bad business image, reputation and reduced credit extension by creditors due delays in payments for goods purchased on credit.

The results also indicate that Average collection period (ACP) is negatively related to profitability and is not significant. This shows that management should focus on reducing average collection period to increase profitability. However, it is not a critical factor in improvement of profitability but it is important.

There is a positive and not significant relationship between IVID, CCC and profitability; hence it is important but not critical in determining profitability of firms in the sub-sector. This implies that management should increase holding of inventory to optimal levels to reduce stock-outs, thereby reducing production disruptions and meet customer needs in a timely manner. The CCC is positively related to profitability and is not significant. Hence, it is an important factor to consider in profit improvement but not critical.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Introduction

This research project sought to establish the relationship between the four variables of working capital and profitability of companies in the electric power sub-sector in Kenya. They include the average payment period, cash conversion cycle, and average collection period and inventory turnover in days. This chapter seeks to give a summary of the variables analysed, conclusion, recommendations, limitations of the study and suggestions for further study.

5.2 Summary

It has been established that the average collection period (ACP) is negatively related to profitability.Therefore, it is important that firms in the electric power sub-sector work on modalities of reducing the average receivables collection period to improve profitability. The APP, IVID and CCC are positively related to profitability of firms in the electric power sub-sector in Kenya. APP is significantly different from zero at 5% significance level and therefore it is critical to improvement of profitability in the electric power sub-sector in Kenya. It implies that the companies should actually delay payments to suppliers to have enough cash to invest in inventory hence increasing sales reaping the expected profitability. The IVID is positively related to profitability implying that management should increase inventory to optimal levels to reduce stock-outs and production interruptions in order to meet customer needs continuously. However, the research also indicates that a high investment in

inventory contributes to low profitability as shown by a negative regression coefficient (Padachi, 2006).

The overall models analysis also showed that APP is marginally significant in relation to profitability of the firm. The models for ACP, IVID and CCC are not statistically significant to profitability in the electric power sub-sector in Kenya. However, all the predictor variables have established relationships with profitability and management should focus on them to realise improved profits.

5.3 Conclusion

Most companies in the electric power sub-sector have invested heavily in working capital. It is clear that management of working capital impacts on firms' profitability. Therefore, it is imperative that companies focus on efficient, effective and optimal management of working capital to improve their profitability. The findings show that average payment period is significantly and positively related to profitability. It is the responsibility of management to delay payments to suppliers hence increasing available cash to invest in new investments increasing sales and profitability. However, the delay in payments to suppliers should be optimized to avoid bad business reputation and safeguard the credit worthiness of a business.

The average collection period is negatively related to profitability and is insignificant. The accounts receivables should be collected fast enough to avail cash to meet short-term business obligations and invest in business opportunities. This should be carefully managed to avoid harassment of debtors to the point of a reducing sales due to poor handling of debtors.

The Inventory turnover in days is related positively with profitability. Therefore, inventory levels should be increased to optimal levels to avoid stock-outs and production interruptions.

A production interruption raises issues of reliability and reduced sales as well as a poor public image regarding quality of service delivery. It is in the interest of management to monitor inventory to mitigate the risk of lost business opportunity due to reduced sales.

This implies that management of working capital is not only important but critical to the profitability of firms in the electric power sub-sector in Kenya.

5.4 Recommendations

The companies in the electric power sub-sector in Kenya should focus their effort in efficient, effective and optimal management of working capital to reduce over-reliance on government funding to run their operations. There should be a clear cut policy with regard to management of grants and other sources of funding. Structures, laws and regulations on fees to be charged for services offered to the public or other companies should be developed to allow companies to make sales and generate their own revenues. A better way of running the grants and external funding should be developed to measure the performance of organizations that rely on these sources of funds to ensure continued growth and sustainability.

A standard needs to be developed for financial reporting in the electric power sub-sector in Kenya. There are companies' makings sales while others declare profits without making any sale or undertake little sales. Hence, comparable performance may not be done to discern performance of a specific company.

There are too many organizations that seem to be offering related services hence some of these organizations should be merged to reduce overburdening the public with charges which can better be offered by one or two organizations.

5.5 Limitations of the study

Some sampled companies declined and while others reneged on their promises to provide their financial information owing to sensitivity and confidentiality of the information making the research difficulty. As a result only six companies responded out of a total of 10 selected companies. Hence, the sample size became small and a small error is quite significant in the analysis. In addition, a number of selected companies were established recently hence the study lacked full financial information with regard to the study period of 2008-2013.The analysis involved average values for each variable and as a result a short period may not be a good forecast for the companies' financial performance and profitability for trend analysis.

A good fraction of the sampled companies relied on grants and other sources of funding and had little to do with sales hence there were many assumptions with regard to sales and cost of sales to enable the working capital ratios to be applicable. A good number of companies reiterated that they are yet to set up policies and structures to start pricing their services in terms of sales. Hence capturing sales from financial statements was not an easy task and assumptions had to be made to allow the study to proceed. Sales were equated to revenue and Cost of sales to cost of revenue in some instances to enable the ratios to be calculated.

The literature in most books address inventory, cost of sales, sales and do not consider grants and government funding in the ratio calculations hence it was difficulty to do calculations for companies that have no sales and their source of revenue is either grants or government funding or other sources of funding to determine sales or cost of sales. It was difficult to derive some ratios for companies that had one variable missing throughout the period of study.

Most of the costs in the financial statements are ambiguous hence determining costs attributable to revenue was difficulty owing to the fact that they are either grants or government funding and little sales or no sales at all for some companies.

The limitations of ratios in analysis are latent and hence comparisons within the industry or firms may not be feasible.

5.6 Suggestions for Further Study

There is a big gap in using ratios to calculate financial performance for organizations that rely on grants, government funding to make profits. A method should be developed to determine profitability of organizations that make little or no sales at all but still are profits making organizations to determine their efficiency, sustainability and financial performance. The sample size should be increased to have better estimates of the population variables especially in situations where there was marginal significance of profitability.

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Appendix 1

Players in the Electric Power Sub-Sector in Kenya

The Ministry of Energy

Energy Regulatory Commission (ERC)

KenGen

KPLC

Kenya Electricity Transmission Company Ltd (KETRACO)

Geothermal Development Company (GDC)

Rural Electrification Authority (REA)

Independent Power Producers (IPPs)

Appendix 2

List of Independent Power Producers

Aggreko

Iberafrica Power (EA) Ltd

Tsavo Power Company Ltd

OrPower4 Inc

Rabai Power Ltd

Thika Power

Gulf Power

Triumph Generating Company

Appendix 3

Co-generation Plants

Mumias Sugar Comapany Ltd.

Appendix4

List of the 10 Power Generating, Transmission and Distribution Companies

KenGen

KPLC

Rural Electrification Authority

Geothermal Development Company

Kenya Electricity Transmission Company

Aggreko

Iberafrica Power (EA) Ltd

Tsavo Power Company Ltd

OrPower4 Inc

Rabai Power Ltd

Appendix 5

Letter of Introduction.

Terry Chepkania Lumbasi

C/O University of Nairobi

Admission No: D61/61771/2010

August 8, 2014

The Finance Manager,

Dear Sir/Madam,

RE: **Data collection approval for MBA project.**

The above matter refers. I am an MBA student at the University of Nairobi conducting a research, topic titled "**The relationship between working capital management and profitability of companies in the electric power sub-sector in Kenya"**.

Kindly, I would be grateful if I would receive data in relation to the above mentioned research topic from your company.

Look forward to your kind assistance. Thank you.

Yours faithfully,

Terry Chepkania Lumbasi

Appendix 6

Data Form

Company Name	2008	2009	2010	2011	2012	2013	AVERAGE
	KShs'000	KShs'000	KShs'000	KShs'000	KShs'000	KShs'000	KShs'000
SALES							
COST OF SALES							
GROSS PROFIT							
AVERAGE INVENTORY							
AVERAGE ACCOUNTS RECEIVABLES							
AVERAGE ACCOUNTS PAYABLES							
CURRENT LIABILITIES							
TOTAL LIABILITIES							
CURRENT ASSETS							

Appendix 7

Companies from which Data was collected.

No	NAME OF COMPANY
1	KENGEN
2	KPLC
3	GDC
4	KETRACO
5	REA
6	TSAVO POWER COMPANY

Appendix 8-Average values of Data collected from companies Kes '000'

NAME OF COMP	KENGEN	KPLC	GDC	KETRACO	REA	TSAVO PO
SALES '000'	14,454,330	68,299,949	826,119	515,947	3,902,462	78,558
COST OF SAL	10,081,771	45,552,607	1,163,542	264,925	628,849	63,455
GROSS PROF	4,372,559	22,747,342	-337,423	251,021	3,273,614	15,103
AVERAGE INVEN	1,206,918.00	8,548,285.75	877,265	0.00	3,091,106	2,686
AVERAGE ACCOUNTS RECE	2,800,971.58	12,318,490.75	760,741	331,907.75	876,812	10,902
AVERAGE ACCOUN	4,055,387	18,119,398	1,700,834	2,384,425	684,510	11,242
CURRENT LIAB	10,690,274	26,198,035	2,747,580	3,009,949	887,839	13,495
TOTAL LIABILITIES	77,256,749	67,362,817	30,952,092	21,365,344	887,839	24,355
CURRENT ASSETS	20,492,974	26,918,358	3,187,839	6,399,336	5,320,738	18,364
TOTAL ASSETS	145,336,718	107,126,355	29,850,724	25,044,507	16,670,725	59,099

Appendix 9

Ratio Analysis Results

No	NAME OF COMPANY	Gross operating profit margin	Average payment period(days)	Average collection period(days)	Average age inventory(days)	Cash conversion cycle(days)	Natural log of sales	Current ratio	Debt Ratio
1	KENGEN	0.302509	146.821	70.72999	43.69521	-32.3959	16.4865	1.916974	0.531571
2	KPLC	0.333051	145.1855	65.83093	68.49497	-10.8597	18.03942	1.027495	0.628816
3	GDC	-0.40844	533.5469	336.114	275.1958	77.76289	13.62449	1.160235	1.036896
4	KETRACO	0.486526	3285.135	234.8041	0	-3050.33	13.15376	2.126062	0.853095
5	REA	0.838859	397.3075	82.00885	1794.158	1478.859	15.17712	5.992906	0.053257
6	TSAVO PO	0.192248	64.66424	50.65527	15.45112	1.442157	11.27159	1.3608	0.412106