

**RELATIONSHIP BETWEEN PREPAID BILLING SYSTEM AND WORKING
CAPITAL MANAGEMENT AT KENYA POWER AND LIGHTING COMPANY**

BY

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DECLARATION


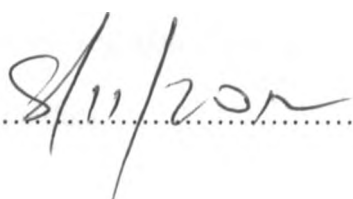
This research project is my original work and has not been presented for a ward of degree in any other university

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DEDICATION

This research has been dedicated to my dear wife Agnes Kitondo who has been a great inspiration, my children Genesis Munene and Vision Muuo for their encouragement throughout the process. Secondly, I want to dedicate this research to my dad Julius Moki Mailu because his hand drove fear out of me and triggered the urge to succeed. Last but not the least, my mum Mary Ndimu, a lady full of Gods wisdom who has been a great source of inspiration and guidance since my childhood.

ABSTRACT

Prepaid billing system is a system of “pay as you use”; a system of buying/selling electricity before use. This system does not limit itself with prepayment meter only; rather it is a complete different system of revenue cycle management from “meter to cash” cycle. This study was therefore conducted to establish the relationship between prepaid billing system and working capital at KPLC.

A case study design was adopted which used secondary data obtained from financial statement for the three years covering 2009 to 2012. Data analysis was done by use a regression analysis.

The study established that there exists both negative and positive relationship. The empirical results shows prepaid billing has significant negative relationship with average collection period. This is because the prepaid billing system is a primarily way of assisting firms to collect revenue and reduce debt. Average payment period and cash conversion cycle was found to have negative but non-significant relationship with prepaid billing system. Some empirical findings conflicted theoretical and general expectations: the finding of this study found that there was a positive non-significant relationship in regard to inventory turnover in days. The study recommends that initially, prepaid billing should be introduced as means of revenue collection or debtor management until a significant number is achieved when their relationship with other working capital element such as average payment period and cash conversion cycle can be perfected.

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ABBREVIATIONS

ACP	-	Average Collection Period
APP	-	Average Payment Period
CCC	-	Cash conversion cycle
IDA	-	International Development Agency
ITID	-	Inventory Turnover In Days
KPLC	-	Kenya Power Lighting Company
MPPBS	-	Meters In Prepaid Billing System
NOP	-	Net Operating Profit
NSE	-	Nairobi Stock Exchange
PPM	-	Prepaid Meters
ROA	-	Return On Assets
ROE	-	Return On Equity
RONA	-	Return On Net Assets
SMEs	-	Small and Medium Enterprises
VSE	-	Vietnam Stock Exchange
UK	-	United Kingdom

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Companies can sell their goods on credit or cash. Cash sale is inflow of cash and it is controlled under cash flow analysis while credit sale implies that the cash will not be received immediately and creates sundry debtors. Therefore, the company has to receive money from these debtors. If a company starts to sell on return of cash, then it decreases the level of company's sale and profitability. On the other side, if a company promotes credit sale, it can increase the risk of bad debts. Debtor management is the process of making decisions relating to the investment in business debtors. In credit selling, it is certain that we have to pay the cost of getting money from debtors and to take some risk of loss due to bad debts. To minimize the loss due to not receiving money from debtors is the main aim of debt management and one way is through prepayment system (Kiilu, 2010).

Mungai (2010) did a study of the relationship between working capital management and the systematic risks of 22 sampled companies quoted in Nairobi Stock Exchange. He found that by reducing the duration of the cash conversion cycle to the minimum, the wealth of the shareholders will be enhanced as highlighted by Shin and Soenen (1998), Kithii (2008) and Reheman and Nasra (2007). Therefore managers should strive to employ efficient working capital management such as prepaid billing system so as to reduce the duration of cash conversion cycle.

Kiilu (2010) did a survey on the working capital management practices among large construction building companies in Kenya and found that to enhance the management

of the receivables, the firm should periodically review the credit worthiness of the existing customers and the case of delayed payment should be thoroughly investigated. The solution of the above problem would have been a prepaid billing system.

1.1.1 Prepayment Billing System

Okonga (2012) defines prepayment metering system as a system of “pay as you use”; a system of buying/selling electricity before use. He states that the system does not limit itself with prepayment meter only; rather it is a complete different system of revenue cycle management from “meter to cash” cycle. It gives a control over revenue for Electricity Company and over electricity budget for consumer. Thus it is a win-win situation for both supplier and user. However, it has its own pros and cons. While most conventional method of metering is standard postpaid system of metering, pre-paid has its own advantage for both supplier as well as consumer. However, these advantages are not without riders. Firstly the Prepaid system has a relatively high infrastructure cost. Then the ownership of prepaid meter to be with consumer or the utility company is still debatable. The biggest hurdle in prepayment according to Okonga is “Why should you pay in advance when you do not get your salary in advance”.

According to Gómez and Contreras (2003), Prepayment systems refer to the outlay made by a consumer for using a good or service before consumption. In the case of electricity, the distinctive feature of the prepayment system is the reversion of the conventional commercialization system: whereas in the latter consumers hold a consumption credit because they pay for their energy bills periodically and after consumption, in the prepayment system such credit is not available because the

purchase and payment of energy are made prior to consumption. Thus, prepaid systems allow users to consume energy only when they have credit in an electricity account, as supply is discontinued when such credit is exhausted. In all developing countries, there is a challenge of economic efficiency goal of establishing cost reflective tariffs and ensuring that consumers can afford the cost of utilities services. These concerns have motivated firms and regulators to identify technological and regulatory options aimed at encouraging access and making easier for consumers to pay for their services. Latin America has pioneered the adoption of innovative mechanisms. Higher levels of affordability have been sought for with the use of instruments that ease the burden of bills via cost and tariff cutbacks and the introduction of alternative payment means. Indeed, most of the efforts oriented towards securing higher levels of affordability have consisted of mechanisms aimed at reducing the cost of services, either by affecting their quality or by reducing their demand. Other efforts have been targeted, however, towards the adoption of various subsidy schemes, either directly or through tariff structures.

Tewari and Tushaar (2003), in their study noted that a prepayment system was introduced for the first time in South Africa but is now widely used in the UK, Turkey and India. Yet, their use is still controversial. This system has been adopted, for example, in the concession of water services in La Paz-El Alto. In this case, the utility opened commercial offices in low-income areas to facilitate payment of services, so that users could cancel the cost of their consumption at least once a week. Supporters of the diffusion of prepaid meters claim that they benefit both consumers and utilities company because they help users to consume more efficiently and to improve the management of their budget, while allowing firms to reduce financial, operational and

bad debts' costs. On the other hand, those that are against prepaid meters argue that their adoption is expensive for firms and risky for low income consumers, as the insecurity and volatility of their income may force little service usage or, ultimately, involuntary self-disconnection. None of these arguments have been comprehensively examined before.

Carmen de Areco was the first municipality to adopt prepayment in Argentina. Indeed, the district's electricity distribution utility offered prepaid meters to all users since 1996, which created a data rich experiment to apply cost-benefit techniques to evaluate the adoption of prepayment systems. Their study thus contributed to the analysis of policies oriented to ease affordability for at least two reasons. First, because it conducts a complete analysis that factors in the end results of prepaid meters implementation in respect of users, the utility and the government. Second, because it made possible to identify the components of the results i.e. where gains and losses coming from and through this process to help establish regulatory definitions concerning prepaid meters, which in many cases are yet to be made. The empirical evaluation is complemented with an examination of the results of a survey that explores the perception of users about prepaid meters. As opposed to cash or credit sale, in prepayment system one pays for the service or goods before he receives them. Over the last few years, however, prepayment meters either in electricity, water or piped gas have been proposed as an innovative solution aimed at facilitating affordability and reducing utilities' cost. This mechanism essentially requires that users pay in advance for the delivery of goods or services, before their consumption. In this way, consumers hold a credit and then use the service until the credit is exhausted (Tewari and Tushaar, 2003).

1.1.2 Prepayment System and Working Capital

In the traditional credit-based system of electricity delivery, the customer consumes electricity continuously, and makes periodical payments to the utility provider. The amount consumed is measured by an electricity meter. Representatives of the utility company periodically inspect the meter, and the customer is invoiced for the energy consumed. Depending on the terms of payment, customers have various periods of time to settle their accounts. Non-payment may result in customers being disconnected. The basic principle of the prepayment system is the reverse of the credit-metering system: customers decide how much energy they require before they consume it, and pay the relevant amount to the utility company beforehand. The household is then credited with the purchased amount of electricity. After the prepaid amount of electricity is consumed, electricity is automatically disconnected unless the customer makes a further prepayment (Antonelli, 2003).

Credit-based metering and billing is still the dominant mode of utilities delivery. The technology involved is mature and relatively cheap, and its organizational procedures are all in place. However, credit metering is also characterized by high labour intensity, high credit and financing risk, and other cost-related factors. Thus, in principle, prepaid metering offers utility providers the possibility of decreasing the administrative and financing costs of electricity delivery, which in turn will bring down the cost of electricity delivery, or yield higher returns to the utility, or both. Utility providers have long been aware of the potential advantages of prepaid electricity delivery over credit metering, but it was not until the mid-1990s that (partly as a result of the technology development led by Eskom) the PPM technology evolved to a level that would allow its widespread implementation (Okonga, 2012)

Prepaid systems are developed to manage debtors. Company that sells its products on credit can either have strict or liberal credit policy. The liberal credit policy will increase the amount of sale and profitability. But risk will also increase with increasing of sales. If we sell the good to those debtors whose capability to pay is not good, then it is possible that some amount will become bad debts. A company can increase the time limit for paying by such debtors. On the other hand, if company's credit policy is strict, then it will increase liquidity and security, but decrease the profitability (Nyawira, 2010).

Finance managers should make credit policy at optimum level where profitability and liquidity will be equal. However, for the cases of prepayment system in utility company though it is a very strict credit policy, it is ideal for utility company which bills all its services at the end of the period (Mungai, 2010).

Reheman and Nasra (2007) studied the relationship between working capital management and its effects on liquidity as well as profitability of the firm. The study was on 94 Pakistani firms listed in stock exchange for a period of 6 years between 1999-2004. The results showed there was a strong relationship between variables of working capital and the profitability of the firm, there is positive relationship between the size of the firm and its profitability and there is significant negative relationship between debt used by the firm and its profitability. If prepayment system would have been introduced, then liquidity would improve and hence profitability.

Mogere (2003) Studied working capital management among 30 public companies listed in Nairobi Stock Exchange as at 31st December 2002. The results showed there was no significant difference between working capital management policies across five different sectors. The regression analysis also showed that the working capital management policy explained only 35% of the variation in return to the equity.

Ngaba (1990) did a case study of working capital management practice in secondary schools in Kikuyu division; the results showed that receivable management was done by sending students of the overdue debts with letters to the parents and school heads were responsible for management of working capital. There was therefore a need of proper billing system and a prepaid billing system could have been an answer to the problem experienced in working capital management.

1.1.3 Kenya Power and Lighting Company

Kenya Power is utility company created to transmit, distribute and retail electricity throughout Kenya. The company is the only utility company responsible for distributing electricity in the whole country. To facilitate this; the company operates six regional offices with central office whose main office is situated at Stima plaza building, Nairobi region. Other regions include Coast region, Mt Kenya South Region, Mt Kenya North region, North Rift region, Central Rift region and West Kenya region. The regions are further divided into branches to efficiently serve customers in terms of connection and collection of billed amount (KPLC strategic plan 2011).

Over the years, KPLC has operated credit mode of billing its customers which involves a billing cycle of thirty days. This system requires availing convenient collection points to enable customers pay their bills efficiently and conveniently thus why KPLC had opened collection office in every major town besides partnering with other collection Agencies such as supermarkets, banks and post office. Again the system allows the customer credit period of 31 days before the billing. Once the bill is out the customer is given a grace period of 14 days to clear his bill. If the customer does not clear the bill he is given a further 7 days and then disconnected .In total the customer is given credit period of 51 days before paying for the service. The implication of this is that the customer holds the money for 51 days which could have been invested in bank and earned interest for those days (KPLC strategic plan, 2011).

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The credit billing works almost the same for all utility company as evidenced by Ansah (2011). In his study, he revealed that Ghana Water Company offered its services on credit to its customers and it took five weeks after product consumption before customers were expected to make payments. If nine weeks follow before any action is taken against recalcitrant customers, by that time the real value of the debt would have been depreciated because of the nature of inflation in the country.

A major problem faced by KPLC before introduction of prepaid meters was how to collect its revenue. Electricity consumers both individuals and corporate organisations had always evaded paying their electricity bills causing KPLC being indebted billions of shillings. This drove KPLC to adopt alternative methods of collecting revenues. Before the introduction of the pre-paid billing meter, KPLC was using the analogue electric billing and fixed billing meter. With the analogue billing meter, the meter records the amount of power consumed, after which a bill is sent to the consumer for payment.

However, KPLC officials do not consistently record monthly meter readings. Hence, some consumers do not receive their bills at the appropriate time while some receive over-estimated bills that they find difficult to pay for. Another group of consumers that do not own meters get monthly fixed bills without regards to how much electricity they consume in a month. Due to the poor satisfaction as a result of KPLC inefficiency, some frustrated consumers go as far as illegal connections to get power. Some even leave their electrical appliances switched on even when not in use. This is done in order to compensate themselves for the high billing rate and sporadic power supply. Due to the huge debt owed by consumers, KPLC introduced a cash collection policy called Easy Pay that involves using private organizations such as designated banks in the collection of money paid. The consumers were expected to pay their bills at their banks. This was to facilitate regular and prompt payment of bills, as consumers needed not to travel far outside their area searching for KPLC offices to settle their outstanding bills. KPLC carried out an aggressive media campaign to persuade consumers to pay their bills; through television, radio, and billboards. However, this did not yield the expected result; hence the pre-paid billing meter was introduced in 2009 (KPL vending manual, 20011).

In response to the above situation, KPLC introduced the new billing system of prepaid metering. KPLC has opened vending points to dispense prepaid token and has also partnered with retailers to sell token to customers in three categories including super retailers who owns their own network and covers wide areas like petrol station, banks and supermarkets. The last category of retailers is small retailers who operate small shops in estates. The rationale behind the new system is to reduce the cost of debtor management which includes bad debts costs, operational staff cost such as salaries paid to cashiers, meter readers etc., office space expenses which in return will lead to the company profitability (KPLC Vending Operation Manual, 2011).

1.2 Statement of the Problem

KPLC credit metering attracts high operation costs which involves direct staff costs relating to meter readers, cashiers, debt control staff who are employed to read, collect and disconnect customers who have not paid, commission paid to collection agency, high provision for bad debts and even bad debts, office space as well as queuing time in banking halls. To minimize all of the collection operation costs the company introduced prepaid electricity meters in a pilot study. It is upon this pilot study that the company in its strategic plan intends to roll out the 500,000 prepaid electricity meter in all other regions by 2014 (KPLC Vending Operation Manual, 2011).

From an economic perspective, the reversion of the commercialization system as implied by prepaid meters translates into changes in the cash flow of the utility and in Consumers behavior. In the case of the firm, prepayment systems may result in a decrease in metering, billing, disconnection and reconnection costs. The fact that payment is made prior to consumption implies both a significant improvement in the collection of revenues and a reduction of working capital. Moreover, prepaid systems may constitute a way to provide more flexible payment options to users with minimal or unreliable income streams without increasing transactional costs to the firm. From the consumer's perspective, prepayment systems may result in a better understanding of how much energy is being consumed, inducing more control of energy use and budget management (Tewari and Tushaar, 2003). However, these apparent improvements are not cost free: not only the change from conventional to prepaid electricity imply a change in consumption habits, which may reduce the utility of consumers, but also it may result in too few electricity consumption or in the self-disconnection of poorer groups of consumers.

The technology has gained popularity with Kisumu water and Sewerage Company intending to go prepaid and Nairobi water and Sewerage Company too starting digital water meter with intention of introducing prepaid meter later. This initiative was further supported when the company received a grant from IDA of 680 million shilling to purchase prepaid meters and 2500 million shilling for prepaid metering system. All the above initiatives were geared toward customer's service efficiency and increasing profitability through reduction of operating cost and proper working capital management (KPLC strategic plan, 2011). But, the biggest question is whether the prepaid electricity meters have achieved the intended objectives of improving working capital management and profitability.

Bett (2009) carried a study on working capital management and profitability in Kenya referral hospitals; He found that there are policies that were not adhered to leading to poor performance of the hospitals. Mogere (2003) did a survey of working capital management among microfinance institutions in Kenya while Nganga (2009) studied the relationship between working capital and profitability of the listed companies in the Nairobi stock exchange. She found that the accounts receivable period and leverage significantly and negatively affect profitability, while increase in receivable period also increased sales which in turn increased profitability and hence the results were contradicting as it showed working capital positively and also negatively affects profitability.

Ngaba (1990) studied working capital management in Kenyan secondary schools. Mungai (2010) conducted a study on relationship between working capital management and systematic risk of companies quoted in Nairobi Stock Exchange.

Nyawira (2010) studied the relationship between working capital management and profitability of retail super markets in Kenya and Kiilu (2010) carried a survey of working capital management practice among large building construction firms in Kenya.

Mwaura (2012) conducted a research on adopting prepayment billing system to reduce non-technical energy losses in Uganda citing lessons from Rwanda and found that prepaid billing system reduced power theft. Ariel and Luciana (2008) also did a study on cost benefit analysis on prepaid meter in electricity and found that the advantages of the system are linked to reduction of arrears in accounts receivable, operational and financial cost.

From the studies done it is evident that many studies done on working capital have been done in countries with developed economies while those done in developing countries like Kenya have all concentrated on manufacturing and super market; none has been done on electricity company and working capital management. Secondly most of them yield mixed results for example study by Nganga (2009) on the accounts receivable period negatively affects profitability while at the same time the accounts receivable period increases sales that increases profitability. Thirdly, given the nature of utilities companies their locations, the size and trade in remote environment in which they operate there is a need to conduct a separate study and therefore the purpose of this study was to fill the gap by finding relationship between prepaid billing system and working capital at Kenya power and lightning company .

1.3 Objective of the Study

To establish the relationship between prepaid billing system and working capital management in Kenya Power and Lighting Company.

1.4 Significance of the Study

The relationship between prepaid billing system and working capital management in Kenya Power and Lighting Company will be useful to various stakeholders including:-

The Management

Kenya power and lighting company management will be able to evaluate and use it as a base of making decision on possibility of rollout of prepaid meter to other region.

The Government and Regulatory Institutions

The study will assist the government to come up with policy guideline for service delivery in utility companies. As regards the regulators such as Electricity regulation Authority, the study will be useful for they use some element of working capital such as liquidity position to fix tariff.

Other Utility Companies

To the other utility companies in Kenya such as water companies this study will act as a call to them to implement the system. Currently it is only in telecommunication such as Safaricom and Airtel and electricity utility companies in Kenya under prepaid system while in other countries like South Africa places such as Soweto and Johannesburg have already installed prepaid water meters as analyzed by David and Grey (2005).

To Researchers and Academicians

Lastly and not the least, the researchers and academicians will get an insight and a starting point for further research work because none of research has been done on working capital management in utility industry.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter represents a review of other studies done relevant to this study. It also outlines a theoretical framework for the study. It was therefore important to review issues, concerning prepaid electricity meters and working capital management in Kenya and the rest of the world so as to understand the relationship of prepaid billing system and working capital management at KPLC.

2.2 Working Capital Management and Prepaid System

Working capital is the total of the amounts invested in current assets of the company. Net Working capital results from the deduction of current liabilities from current assets; Working capital management is the management of current assets and current liabilities such that would result in the most desirable level of working capital and maximum company profitability. Inadequate working capital leads the company to bankruptcy. On the other hand, too much working capital results in wasting cash and ultimately the decrease in profitability (Chakraborty, 2008).

Not much research work has been done on prepaid billing system however; Ariel and Luciana (2008) states results of a survey conducted among local electricity users indicated that prepaid meters lead to an increase in welfare. They also indicate that the advantages of the system are linked to the reduction of arrears in accounts receivables and of operational and financial costs on the part of the service provider and to a better allocation of resources for the user. On his study Mwaura (2012) studied how prepaid electricity would reduce non-technical energy losses comparing

the energy from Rwanda. Yet, another closely related study was done by done by Electricity Regulation Authority of Uganda (2011), concentrated on the billing efficiency and found that prepaid meters had improved the billing efficiency of Umeme Company. In all the cases prepaid billing system allows the customers to pay for the good or service before consumption as opposed to credit metering or billing system that allows the customers to consume the goods or service and pay later at agreed period which includes after days or months as illustrated by the figure 1 below:-

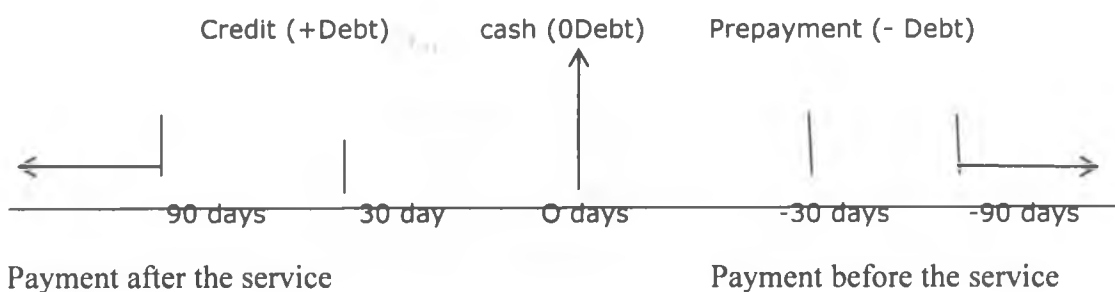


Figure 1: Payment Terms

Source (Ross 1997)

As regards to working capital, a lot of literature on working capital and profitability of the firm has been done; Ansah (2011) studied the working capital management practices within the Ghana Water Company Limited and its impact on the organization's financial position. He noted that liquidity and profitability are two vital aspects of corporate business life and as such working capital has been described as the life blood which flows through the veins and arteries of the entire Organization. Working capital management has thus, become a basic and broad aspect of assessing the performance of a corporate entity. It engages every part of the structure and it gives courage and morale to the management and personnel.

Nobani, Abdollatif and Alhajjar (2010), studied the relationship between the cash transformation cycle and profitability. To perform this research, they used data gathered from 34771 Japanese companies between the years 1990-2004. Results indicated that a negative relationship existed between profitability and the cash transformation cycle. The result was the same in all sample companies except service providers and commercial companies. If relationship is negative, prepaid system would therefore reduce the cash conversion cycle and hence prepaid system would increase profitability.

Huynh (2009) did a study based on secondary data collected from listed firms in Vietnam Stock Exchange (VSE) for the period of 2006-2008 with an attempt to investigate the relationship existing between profitability, the cash conversion cycle and its components for listed firms in VSE. The finding showed that there is a strong negative relationship between profitability, measured through gross operating profit, and the cash conversion cycle. This means that as the cash conversion cycle increases, it lead to declining of profitability of firm. Therefore, the managers can create a positive value for the shareholders by handling the adequate cash conversion cycle and keeping each different component to an optimum level a prepaid system would therefore held to reduce the cash conversion cycle and keep these element of working capital optimal.

Chatreji (2010) studied the impact of working capital management on profitability in companies listed in London stock exchange throughout the years 2006-2008. The researcher used the Pierson correlation coefficient to evaluate the impact of cash

transformation cycle, the period of collection of receivables, inventory retention period, liability settlement period, the current to quick ratio, to net operational profit. Results indicated that a negative relationship exists between working capital management and profitability. This means that an increase in cash transformation cycle would result in a reduction in profitability. Moreover results have also stated that a negative relationship exists between liquidity and profitability as well.

Garcia and Martinez (2007) studied the effects of working capital management on the profitability of a sample of small and medium-sized Spanish firms. They found that managers can create value by reducing their inventories and the number of days for which their accounts are outstanding. Moreover, shortening the cash conversion cycle also improves the firm's profitability.

Singh and Pandey (2008) suggested that, for the successful working of any business organization, fixed and current assets play a vital role, and that the management of working capital is essential as it has a direct impact on profitability and liquidity. They studied the working capital components and found a significant impact of working capital management on profitability for Hindalco Industries Limited.

2.3 Debtors Management and Prepaid System

Prepaid billing is normally developed to manage debtors. Accounts receivable (debtors) is as a result of credit sales. Prepaid system has therefore an ability to reduce the amount of outstanding debt. While, Ariel and Luciana (2008) doing cost benefit analysis of prepaid meters found that cost change due to bad debt was reducing with adoption of prepaid meters. The bad debt rate was obtained from the quotient between

the cost of bad debts (resulting from sum of all charge to profit and loss in concept of allowances for this concept plus court charges) and sales. They also indicated that the advantage of the system was linked to the reduction of arrears in accounts receivables.

Okonga (2012) noted that efficiency in debt collection from the consumers is an area that needs attention by the electricity sector. The question of how the electricity sectors make up for the losses as a result of unpaid electricity bills remains a puzzle. Electricity sectors in Nigeria face crippling non-payment and escalating debts. These researchers emphasize that developing economies have had to labour with huge accumulated debts from yester years, due to un-recovered tariffs and failure to collect debts from consumers. For example in Kenya, KPLC was unable to recover almost half of the unpaid consumer bills totaling to almost Ksh. 10 billion .Department of Minerals and Energy reported that several municipalities in South Africa became bankrupt and collapsed partly due to severe debt implications which included large unpaid bills for electricity supplied to Eskom. City power supply sector of South Africa had been faced with poor administration and weak debt collection mechanisms resulting in losses of revenue. Thus efficiency in debt collection may be a blow to many electricity companies in Sub-Saharan Africa and this requires adoption of a better benchmarking to bring the companies back on to sustainability track.

To sell on credit one needs to do credit analysis. Analyzing the credit-worthiness of the customer is the most difficult task. The financial and no-financial information may provide some insights into the credit worthiness of the customer. An optimal credit amount could be identified by the point where the incremental cash flows from increased sales stimulated by offering credit to the customers equals the costs of

carrying additional investments in account receivables. Therefore, an optimal amount of credit extended could be identified by plotting the total cost of associated with granting a credit with different amounts of credit extended as in carrying costs increase and opportunity costs decrease as amount of credit extended increase and we attempt to identify the minimum total cost point. The carrying costs associated with granting a credit essentially comes from either the costs of cash discounts offered by the firm who grant the credit to its customers who pay early, or it could come from losses of bad debts, or it could be associated with managing credit and credit collections and running the credit department . Opportunity cost is the additional profit results from credit sales that are lost because credit is not granted (Ross, 2008).

The management of debtors is largely determined by the business's credit policy. The investment in accounts receivable, debtors, as well as with all investment decisions, must earn a rate of return in excess of the required rate of return. Major risks that arise from granting credit include bad debts and debtor delinquency, because they reduce them returns from the investment in accounts receivable, and if inadequately monitored can impact severely on the business's financial performance. Credit policy and collection policy have to be actively managed because they affect the timing of cash inflows, sales, profits and accounts receivable risks, Gitman (1997) and Richards and Laughlin, (1980). Any changes in credit and collection policy have a direct impact on the average outstanding accounts receivable balance maintained relative to a business's annual sales (Moss and Stine, 1993, Richards and Laughlin, 1980). Thus a business should take special efforts to monitor both credit granting and credit collection processes (Chang, Dandapani and Prakash, 1995).

Credit terms specify the debtor's repayment schedule and comprise issues such as the cash discount, the cash discount period, and the credit period. Any changes in these three variables may affect sales, the investment in account receivable, bad debts and profits. For example a decision to increase the cash discount should be evaluated by comparing the profit increases attributable to the added sales, the reduction in accounts receivable investment and the reduction in bad debts to the cost of the discount. On the other hand a decision to decrease the cash discount should be evaluated by comparing the profit decreases attributable to the added sales, the increase in accounts receivable investment and the increase in bad debts to the cost of the discount (Gitman, 1997).

Once credit has been granted, and credit sales have been made, accounts receivable has to be collected. The goal of collection management's goal is to ensure that payments are received according to schedule, otherwise a greater investment in accounts receivable will be needed. If receipts from accounts receivable can be speeded up, without prejudicing sales or customer goodwill, less capital will be needed to fund accounts receivable, and less money will be spent on recovery, because of administration, investigation, collection and bad debt costs (Gitman, 1997)

In order to achieve satisfactory performance by debtors, several tactics have been suggested. These include adding finance charges for late payment, providing incentives for early payment, shortening the credit period contractually (Moss and Stine, 1993) or trading only for cash, discounting or factoring accounts receivable to speed up the cash inflows outsourcing accounts receivable, analyzing payment patterns using the Markov Chain Analysis, ad hoc scoring, simple probability, linear

discriminant and sequential decision system, monitoring days sales outstanding and aging schedules, using balance fractions, payment proportions and variance analysis (Cote and Latham,1999). Accounts receivable management and inventory management is closely linked in that account receivable are inventories that have been sold yet have not generated cash inflows.

2.4 The Cash Conversion Cycle and Prepaid System

Brigham and Houston (2004) states that the cash conversion cycle focuses on the length of time between when the firm makes payments and when it receives cash inflows. The key terms used in the model are; inventory conversion period, which is the average time required to convert materials into finished goods and then to sell those goods, receivables collection period, which is the average length of time required to convert the firm's receivables into cash, payables deferral period, which is the average length of time between the purchase of materials and labour and the payment of cash for them. Moreover since the cash conversion cycle is the most important criterion for evaluating working capital management (Mussawi, Laplaute and Kischnick, 2006), the relationship with profitability was confirmed and it was thus concluded that a significant relationship exist between working capital management and profitability. Introduction of prepaid meters would therefore help working capital management.

The study by Ogujor and Otosowie (2010) reveals that while the introduction of the prepaid meter increases the revenue collection, it reduces revenue generation because it is reliability based. Improving power reliability will increase revenue generation in the prepaid scenario. Prepaid meters ensures that the consumer pays only for energy

consumed and not the estimated bill in the postpaid system and one can see a large standard deviation in the units of energy consumed. The number of registered customer in the first and second quarter of 2008 in Nigeria is 4731009 and 4,771,035, respectively, while prepaid meters installed are 93134 and 99317, respectively. The differential in registered customer between the two quarters is 40,026 while differential in installed prepaid meters between the two quarters is 6,183. One would have expected that the differentials will at least be equal to the 40,026 newly registered customers. This can be attributed to dwindling revenue due to the dependence of the prepaid system on reliability resulting in the reduction of its installation.

Most of the empirical studies support the traditional belief about working capital and profitability that reducing working capital investment would positively affect the profitability of firm (aggressive policy) by reducing proportion of current assets in total assets. Deloof (2003) analyzed a sample of Belgian firms, and Wang (2002) analyzed a sample of Japanese and Taiwanese firms, emphasized that the way the working capital is managed has a significant impact on the profitability of firms and increase in profitability by reducing number of day's accounts receivable and reducing inventories. A shorter Cash Conversion Cycle and net trade cycle is related to better performance of the firms. Furthermore, efficient working capital management is very important to create value for the shareholders. However, this relationship was not found to be very significant when the analysis was for specific industry (Soenen, 1993). Jose, Lancaster and Stevens (1996), performed an industry wise analysis and measured the ongoing liquidity by Cash Conversion Cycle.

Controlling industry and size differences they have concluded that more aggressive liquidity management is associated with higher profitability for several industries.

2.5 Empirical Studies

Many researchers have studied financial ratios as part of working capital management however; very few of them have discussed the working capital policies of the specific components of working capital (Nyawira, 2010). Ariel and Luciana (2008) did a cost benefit analysis of prepaid meter in South Africa and found that it possible to identify the change in aggregate welfare resulting from the adoption of the prepayment system as well as in each of the groups concerned. The adoption of this system involved a favorable change in social welfare, which expressed in 1996 constant prices reaches \$a 38 per user of electrical power. The increase in social value was not distributed in a constant way among the various groups involved as, while the distribution utility and the users obtain a net profit, the government sustains an important loss generated by lower tax revenues related to changes in electricity consumption. In addition, the increase in social welfare exhibits an evolution over time which is typical of investments with high sunk costs, because the results show that in the first years of implementation the system generated losses owing mostly to the high cost of the technology involved. These results are however reversed and more than compensated for when the period of analysis is longer.

Salihu and Pamela (2010) did a research on evaluation of effect of ICT on development focusing on prepaid electricity billing in Nigeria by concentrating on the introduction of the prepaid electricity billing system in Nigeria and the supporting arrangements to enable citizens have access to electricity supply. The study

highlighted the extent to which the prepaid electricity system contributed to enhancing people's freedom to participate in developmental activities and then derived some implications on economic development.

More closely related study was done by Mwaura (2012) on adopting electricity billing system to reduce non-technical energy losses in Uganda and found that the prepaid system reduced power theft and the benefits surpasses cost. Although Mwaura was comparing Rwanda Experience with that of Uganda he noted that apart from non-technical losses prepaid meters had effect on financial losses such as revenue collection losses including bad debt.

A study by Electricity Regulation of Uganda (2011), found that the new billing system implemented by Umeme has certainly played a vital role in loss reduction. Umeme, in its loss reduction strategy for 2006–2009, had acknowledged that non-technical losses would be reduced after the implementation of new system. As a part of this study, the following parameters were analyzed, to determine the impact of the new billing system on loss reduction; the billing efficiency ratio is an important parameter based on which Umeme's performance can be monitored. The billing efficiency ratio is defined as the total energy billed as against the total energy purchased. Comparison of the monthly billing efficiency ratio during 2009 and 2010 it can also be noticed that the range of variation between the maximum billing efficiency (75%) vis-à-vis the minimum billing efficiency (67%) reported by Umeme during 2010 is less than the range of variation reported in 2009. The maximum monthly billing efficiency was 69% and the minimum was 57% during 2009. This shows that there has been an improvement in customer-billing.

Panday and Panday (2012), Also did an exploratory survey on the attitude of Delphi consumers on the prepaid meters. A sample size of 800 consumers was used. The consumers were randomly selected. The study concluded that prepaid electricity meter is an excellent way to minimize revenue losses, overcome recovery dues etc. But like prepaid mobile consumer should be given a chance of both prepaid meter and postpaid system. Utility company should not force consumer, but motivate the consumer for voluntary acceptance for prepaid metering system. More information seminars and public awareness campaign should be encouraged by company.

Other studies on prepaid meters include that done by Ogur and Otosowie (2010) on impact of prepaid meters on revenue generation in Nigeria and found that while the introduction of the pre-paid meter increases the revenue collection, it reduces revenue generation because it is reliability based. Improving power reliability will increase revenue generation in the prepaid. Prepaid billing ensures that the consumer pays only for energy consumed and not the estimated bill in postpaid as can be seen in the large standard deviation in the units of energy consumed.

In nutshell as regards literature review locally there has been several studies done on working capital management though none has been done on utility company as well as prepaid system. Kiprono (2004) did a study on relationship between cash flow and earnings performance measure for companies listed in Nairobi stock exchange .His objective was to establish relationship between ROA, ROE, and RONA against the cash flows. He used regression analysis on thirty companies which were randomly picked for five year period between 1998 and 2003.The study found that there is

direct/positive association between cash flow from operating activities and all return performance indicators.

Similar study was done by Mogere (2003) who studied 30 public companies listed in stock exchange as at 31st December 2002 with aim of determining the effect of amount of long term financing of current asset on the profitability and hence if there was a relationship between working capital management policy and profitability . The regression analysis shows that working capital policy accounts for 53%of variations on return to equity.

Njoroge (2008) did study on working capital financing of 30 microfinance institution in Kenya and found that policies slightly differed across various categories of micro finance. While Bett (2009) did evaluation of working capital management practices in referral hospitals and concluded that although the referral hospitals have financial policies to guide financial management practices, these policies were either too general or superficial and there was various challenges affecting management of working capital and hence operational efficiency was challenged as well as liquidity.

Further study in working capital management was done by Nyawira (2010) on the relationship of working capital management and profitability of retail super markets chains in Kenya. Multiple regression was used and it was found that the exist relationship between working capital management and profitability in retail supermarket chain in Kenya.

Kiilu (2010) also did a survey of the working capital management practices among large building construction companies in Kenya by studying 656 companies through use of primary data which was collected by questionnaires. Findings of the study were that majority of the firms prepared cash budget and had written statement regarding petty cash. She further concludes proper debtor management was done as there was credit standing of the new customers as well as periodic review of credit worthiness of existing customer.

2.6 Theoretical Framework

This shows the various independent and dependent variables which are available for this study and the possible relationship between them. Working capital element of Kenya power and lightning company varies as a function of independent variable; cash flow, debtors, operating cost due to increase in number of prepaid meters installed. Moderating variables include lack of policy and strategy in prepayment system and government policy and intervening variables; Nature of prepaid meters as well as the technology supporting prepaid meters.

Theoretically, prepaid billing system has relationship with the various elements of working capital which include cash conversion cycle, average collection period, inventory turnover and average payment period. Prepaid billing system is expected to improve revenue collection and as a result the cash conversion cycle to be reduced as well as average collection period. It is also expected that prepaid billing system will increase liquidity position and therefore the company will be able to timely pay its creditors resulting to reduction of average payment period. In relation to inventory, the prepaid billing system is expected to increase the inventory turnover.

2.7 Conclusions

In order to develop the framework for the study, relevant literature was established in both developed and developing countries. None of the study has been done on working capital in KPLC in regards prepaid system. Experiences learnt from the relevant studies will be used as referral point in utility company and prepaid system in working capital management.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The chapter seeks to bring out the different methods which were used in the research design. It constitutes research design, population and sample size data collection and the data analysis procedure used. In this study secondary data was used.

3.2 Research Design

A case study was used in order to find the relationship between prepaid electricity meters and working capital management at Kenya Power and Lightning Company. Mugenda and Mugenda (1999), states that a case study is in depth investigation of an individual institution or phenomenon whose purpose is to determine the relationship that has been caused by the phenomenon of the study. The case study approach was adopted because of its ability to facilitate an in-depth study of the problem.

According to Best and Kaln (1998), the case study probes deeply and analyses interactions between factors that explain present status or influence change or growth. The case study allows the researcher to study selected issues, cases or events in details to explore and describe them. It also allows the researcher to study issues, which occur in their natural settings where human behavior occurs.

Coopers and Schinder (2003) states that in contrast to survey in which many people are studied, a case study is an in-depth study, intensive investigation of individuals or small groups of people or an organization. Kenya power has six regional divisions;

central office, Nairobi Region, Coast region, Mount Kenya, Central Rift and West Kenya.

3.3 Data and Data Collection Methods

The research used secondary data which was obtained from financial statement for three years covering period 2009 to 2012. This data represented three years after introduction of prepaid meters. The reason for use of this data is because it was readily available as it relates to the current period and had not been archived.

3.3.1 Measurement of Variables

As Miles and Huberman (1994) points out, a conceptual framework explains either geographically or in a narrative form the main issues to be studied. A conceptual framework covers the main features (aspects, dimensions, factors, variables) of the study and their presumed relationship (Robson, 1993). He also argues that developing a conceptual framework enables one to be explicit about what the researcher thinks he is doing. It helps to select and decide which relationships are important and therefore which data is to be collected and analyzed. This study was undertaken to identify the relationship that existed between prepaid electricity meters and working capital management at KPLC. Choice of variables for the study was influenced by previous studies on working capital management.

Meters under prepaid billing system (MPPBS) was used to measure the element of prepaid billing system. This was used as dependent variable. Average collection period (ACP) was used as proxy for collection policy as an independent variable. ACP is calculated by dividing accounts receivable by sales and multiplying the results

by 31(number of days in a month). Average payment period (APP) was used as proxy for payment policy as an independent variable. It is calculated by dividing accounts payable by purchases and multiplying the results by 31(number of days in a month)

Inventory turnover in days (ITID) used as proxy for inventory policy is also an independent variable. It is calculated by dividing inventory by cost of goods sold and multiplying with 31 days (number of days in a month). The cash conversion cycle (CCC) was used as comprehensive measure of working capital management as another independent variable is measured by adding average collection period with inventory turnover in days and deducting average payment period.

All of the above variables have a relationship that ultimately have relate with working capital management. It was expected that there was a relationship between meters under prepaid billing system (MPPBS) in one hand and the measure of working capital management (number of days accounts receivable, account payables and cash conversion cycle) on the other hand.

3.4 Data Analysis

Data analysis is the process is of bringing order to structures and interpretation to the mass of collected data (Marshall and Rossman 1999). Statistical packages for science (SPSS) version 17 was used as an aid to analysis .This package is preferred because of its ability to cover a wide range of most statistical and graphical data analysis and is systematic.

3.4.1 Prepaid Billing System and Working Capital in KPLC

In order to understand the relationship between prepaid billing system and working capital management a simple regression model was used. Coefficient of single regressions was computed. Single regression enabled better prediction of behavior of various dependent variables.

KPLC billing is normally done monthly and therefore in order to get the relationship between prepaid billing system and working capital management all working capital elements under study were computed monthly and compared with meters billed under prepaid billing system. This ensured that there was at least thirty six periods under study using the model below.

Model specifications

Specifically the regression models were developed for each element of working capital and were all run separately:

1. $ACP = B_0 + B_1MPPBS + e$
2. $APP = B_0 + B_1MPPBS + e$
3. $ITID = B_0 + B_1MPPBS + e$
4. $CCC = B_0 + B_1MPPBS + e$

Where:

MPPBS= Meters under prepaid billing system.

ACP=Average collection period

APP=Average payment period

ITID= Inventory turnover in days

CCC=Cash conversion cycle

e=error

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

Monthly billing and financial data obtained from financial statements of KPLC for the last three years for a period covering June 2009 to June 2012 was used to compute ratios used as proxies to measure working capital management. These were fed into SPSS version 17. To measure the relationship between prepaid billing system and working capital a regression analysis was used. This chapter presents data analysis results. It sets off with regression analysis; summary of findings follows and culminates in interpretation of findings.

4.2 Data Analysis and Findings

In order to get the relation between prepaid billing system and working capital element of KPLC a regression analysis was done

4.2.1 Regression Analysis

Simple liner regression analysis was done on the variable so as to determine the relationship between meter billed under prepaid billing system and four element of working capital; ACP, APP, ITID and CCC and error term for 36 periods. To facilitate easy manipulation of meters under prepaid billing system (variable X) log of monthly data was used. This also enabled that significance testing of the b weights rest upon the assumption that errors of prediction ($Y-Y'$) are normally distributed.

The regression equations used were:-

1. $ACP = B_0 + B_1MPPBS + e$
2. $APP = B_0 + B_1MPPBS + e$
3. $ITID = B_0 + B_1MPPBS + e$
4. $CCC = B_0 + B_1MPPBS + e$

Where:

MPPBS= Meters under prepaid billing system.

ACP=Average collection period

APP=Average payment period

ITID= Inventory turnover in days

CCC=Cash conversion cycle

e=error

The results of regression analysis for the four modules were summarized in the table

4.1, 4.2 and 4.3 below

Table 4.1 Summary of Modules under Study

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
ACP	.618	.382	.364	7.14519
APP	.228	.052	.024	36.91272
ITID	.093	.009	-.021	128.72322
CCC	.166	.028	-.001	155.90249

Source (Author, 2012)



Table 4.2 Summary of ANOVA of the Study

Model		Sum of Squares	df	Mean Square	F	Sig.
ACP	Regression	1072.730	1	1072.730	21.012	.000
	Residual	1735.825	34	51.054		
	Total	2808.556	35			
APP	Regression	2543.326	1	2543.326	1.867	.181
	Residual	46326.674	34	1362.549		
	Total	48870.000	35			
ITID	Regression	4869.617	1	4869.617	.294	.591
	Residual	563368.689	34	16569.667		
	Total	568238.306	35			
CCC	Regression	23514.998	1	23514.998	.967	.332
	Residual	826389.975	34	24305.587		
	Total	849904.972	35			

Source(Author, 2012)

Table 4.3 Summary of Coefficient under Study

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
ACP	(Constant)	69.998	13.662		5.124	.000
	MPPBS	-13.191	2.878	-.618	-4.584	.000
APP	(Constant)	137.061	70.579		1.942	.060
	MPPBS	-20.312	14.867	-.228	-1.366	.181
ITID	(Constant)	-	246.12		-8.67	.392
	MPPBS	213.282	7	.093	.542	.591
CCC	(Constant)	421.119	298.09		1.413	.167
	MPPBS	-61.761	62.791	-.166	-.984	.332

Source (Author, 2012)

According to table 4.1 above, the coefficient determinant (R square) for ACP, APP, ITID and CCC is 38.2%, 5.2%, 0.9% and 2.8% respectively. This shows that prepaid billing system explains only 38.2% of variation of ACP, 5.2 of variation of APP, 0.9% of variations in ITID and 2.8 % of variation in in CCC.

Table 4.2 shows that the overall significance of four modules under study was 0.000, 0.181, 0.591 and 0.332 for ACP, APP, ITID and CCC respectively. This implies that of the four modules it is only ACP which was significant. The rest of modules were not significant as were all more than 0.05.

Table 4.3 shows coefficient of variable under study. The result indicates that meters billed under prepaid billing system have a negative significant relationship with ACP. Billing one meter under prepaid billing system will cause increase of ACP by -13.19 and if MPPBS is at constant zero, ACP is 69.99. Meter billed under prepaid billing system have negative non-significant relationship with APP and CCC. Billing one meter under prepaid billing system will cause an increase of of -20.312 and -61.761 of APP and CCC respectively while when MPPBS are at constant zero APP and CCC are 231.28 and 421.12 respectively. Lastly, MPPBS have positive non-significant relationship with ITID in which billing one meter under prepaid billing system will cause increase of ITID by 28.11 and if MPPBS is at constant zero ITID will be -213.28.

4.3 Summary of Findings and Interpretations

Prepaid billing system only explains better variations in ACP by accounting for 38.2% of variations. The rest of working capital element including APP, ITID and CCC, prepaid billing explains only small variation of less than 5.2%. The low determinant of less than 5.2% though not fairly good can easily be explained by the fact that it is only 160,000 prepaid meters which were billed under prepaid billing system compared to customer base of 2 million customers representing 8%. This indicates that there are other factors affecting working capital management of postpaid meters which are 92% of customers of KPLC. As the more meters will be billed under prepaid billing system the determinant is likely to become fairly good.

ITID has positive non-significant relationship with MPPBS. Only 0.09% of its variations are caused by MPPBS. This relationship between MPPBS and ITID is explained by the fact that KPLC is a service provider company and might not need to convert stocks to sales.

Average collection period has a negative significant relationship with meters under prepaid billing system (coefficient -13.191, p-value 0.000) ordinary this was consistent as it is expected that as more meters are billed under prepaid billing system, the average collection period decreases. This agrees with Ogujor and Otosowie (2010), Ariel and Luciana (2008) who stated that prepaid system were developed to assist utility company to collect debt.

APP was found to have a non-significant relationship with meters under prepaid billing system (coefficient -20.312 p – value 0.181). The coefficient of average

payment period though is negative as per expectation and norms but is non-significant and implies that increasing meters under prepaid billing system decreases APP. The negative relation agrees with expectation; it is expected that as more meters are put under prepaid billing system, the liquidity position of the company increased and hence its ability to pay creditors as they fell due but as Ogujor and Otosowie (2010) pointed out, Prepaid billing ensures that the consumer pays only for energy consumed and not the estimated bill as in the case of postpaid which can be seen with large standard deviation in the units of energy consumed. The deviation in the unit consumed could easily affect APP because under prepaid system billing the company pays for only units consumed. This explains why the relation between the APP and MPPBS is less significant because only 8% of customer base is under prepaid.

CCC is a comprehensive measure of working capital management which contains ITID, ACP and APP. The results shows that CCC has negative non-significant relationship with meters under prepaid billing system (coefficient -61.761p – value 0 .332). This is per the norm where it was expected that the more meters are under prepaid billing system, the shorter the CCC but Tewari and Tushaar (2003), argues that, these apparent improvements in relation to prepaid system are not cost free: not only the change from conventional to prepaid electricity imply a change in consumption habits, which may reduce the utility of consumers, but also it may result in too few electricity consumption or in the self-disconnection of poorer groups of consumers and thus why the relationship between CCC and MPPBS is non-significant

Also another reason why CCC and APP had non-significant relationship with prepaid billing is as put by Ariel and Luciana (2008) that prepaid infrastructure calls for heavy investment which is typical of investments with high sunk costs and the results show that in the first years of implementation of the system losses are generated owing mostly to the high cost of the technology involved. These results are however reversed and more than compensated as the period of analysis is prolonged.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

The research was undertaken on the relationship between prepaid billing system and working capital management of KPLC. Previous studies done on working capital management and prepaid billing established statement of the problem which lead to the study, the objective of the study was to establish the relationship between prepaid billing system and working capital management at KPLC. The study undertook literature review of both local and international studies done in the area and a case study design was adopted. Secondary data obtained from monthly billing cycles and monthly management financial statement report for a period between 2009 to 2012. Simple regression analysis was employed in order to establish if there exists any relationship between prepaid billing system and working capital elements. Prepaid billing system was measured by number of meters billed under prepaid billing system while working capital was measured by average collection period, average payment period and cash conversion cycle.

The study found that there exist a relationship between prepaid billing system and working capital management at Kenya Power and Lightning Company. While average collection period and prepaid billing system had a negative significant relationship as theoretically and normally expected, average payment period and cash conversion cycle had negative non-significant relationship with prepaid billing system but the opposite was also found for inventory turnover in days as they had positive relationship with prepaid billing system against norms and theory.

5.2 Conclusions

The objective of the study was to establish the relationship between prepaid billing system and working capital management of Kenya Power. The results shows that in KPLC prepaid billing system have significant impact in working capital management. Average collection period has a significant negative relationship with prepaid billing system. This agrees with normal expectation that as more prepaid meters are installed average collection period is reduced. When the billing is postpaid the collection is done after consumption and ACP is supposed to increase. Negative relationship between prepaid billing system and average collection period is supported by many research which support prepaid collection as best mode of collection for example Mwaura (2012), Ogujor and Otosowie (2010), Tewari and Tushaar, (2003) and Okanga (2012) all support the above argument about prepaid meters.

The study also found that there exist negative non-significant relationship between prepaid billing system and average payment period as well as cash conversion cycle. This was associated with the number of meters under prepaid billing system for the period under study. It is only 8% of 2 million KPLC customers who are under prepaid system and this is not sufficient enough to have significant negative APP and CCC. Another reason why there is a non-significant relationship between prepaid billing system and average payment period as well as cash conversion cycle is heavy initial sunk cost associated with development of prepaid system which can only be recovered in the long run as identified by Ariel and Luciana (2008) and also the self-disconnection in which if the units purchased under prepaid is over, the consumer can decide to buy or ration the consumption and use electricity only for major items. This is opposite of credit billing where such user could continue consuming electricity and

pay at the end of the month. Self-disconnection as put out by Tewari and Tushaar, (2003) will have a lot of impact on the liquidity position of the company and affects both cash conversion cycle and average collection period. Lastly, inventory turnover in days had positive non-significant relationship with prepaid billing due to the fact that KPLC is a service industry and does not depend on inventory to make sales. The study therefore concludes that there exists a relationship between prepaid billing system and working capital at KPLC.

5.3 Policy Recommendations

The results of the study suggest that more meters should be put under prepaid billing system as a way of improving revenue collection of KPLC. Several policies implications should be drawn from the above findings which include that the roll out of prepaid meters initially should be used as a measure of improving revenue collection.

It will be important to achieve a reasonable number of meters under prepaid billing system that will have effect to cash conversion cycle and average payment period because the two element will have negative non-significant relationship with prepaid billing system at initial stage due to heavy sunk investment which needs longer pay back period as identified by Ariel and Luciana (2008).

KPLC should cluster its customers according to income classes and ensure that middle level class customer who can afford to pay for average consumption are put under prepaid billing system. This is to avoid Self-disconnection principle of Tewari and Tushaar (2003) that affect the significance of both cash conversion cycle and

average payment period and therefore if low class (Slum) is put under prepaid billing system, these may start rationing their consumption and only buy token when the economy is favorable. On the hand, high class people who own equipment that consume a lot electricity should be left with credit meters to continue enjoying electricity for they pay without much cost and putting prepaid meter to them may have the same effect of self-disconnection like the low class people.

5.4 Limitations of the Study

There were only 160,000 meters under prepaid billing system in KPLC as at the time of the study compared to KPLC customer base of 2 million customers. This number represents 8% of customer and hence the finding could have been different if more meters were billed by prepaid billing system. The results of the study should therefore not be generalized.

The prediction of the relationship between prepaid billing system and working capital was also affected by factors beyond measurable variable such as consumer welfare for example self-disconnection policy of the consumer which could not be measured under the study.

5.5 Suggestion for Further Study

The study of prepaid meters have not been exhaustively done in Kenya .Similar study need to be done in future when more meters will be under prepaid billing system and results be compared. Secondly, other aspect of prepaid billing such as their effects to profitability should also be studied.

Lastly, comparisons of prepaid billing with postpaid billing with aim of finding out which of the two is economical should be perused.

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APPEDIXES

Appendices I: Data collection instruments

Letter of introduction

Kennedy Moki,

D61/64011/2010

School of Business Studies,

University Of Nairobi.

To

Training and Development Manager

KPLC

Dear sir/madam,

RE: Relationship between Prepaid Billing System and Working Capital

Management at KPLC

I am MBA candidate in the university of Nairobi . I am in my research year of my master's degree studies focusing on "The relationship between prepaid billing system and working capital management at Kenya Power and Lighting Company "

The specific objective of survey component of research is to establish the relationship between prepaid electricity meter and working capital management of Kenya power and lighting company. The purpose of this letter is to request permission to collect data on the above subject. Please be assured that this information is sought for research and academic purpose only and your response will be treated with utmost and strictly confidentiality and no individual response shall be quoted.

Thanking you in advance for co-operation and support

Yours faithfully

Appendices 2: Data Collection Form

Year

Description	Months											
	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Marc	Apr	May	June
MBPPS												
Sales												
Debtors												
creditors												
Purchases												
Inventory												
COGS												

Appendices 3: Variables under study

	Month	MPPBS	ACP	APP	ITID	CCS
1	Jul-09	3,000.00	42	115	-354	512
2	Aug-09	6,000.00	26	61	-95	182
3	Sep-09	9,000.00	14	39	-49	102
4	Oct-09	12,000.00	10	26	-48	84
5	Nov-09	17,000.00	8	24	-31	63
6	Dec-09	25,000.00	5	18	-23	46
7	Jan-10	27,000.00	5	17	-33	55
8	Feb-10	29,000.00	3	15	-24	42
9	Mar-10	31,000.00	3	15	-22	40
10	Apr-10	33,000.00	2	14	-20	36
11	May-10	35,000.00	4	15	-14	33
12	Jun-10	40,000.00	24	165	-206	395
13	Jul-10	45,000.00	11	89	-84	184
14	Aug-10	50,000.00	9	52	-57	118
15	Sep-10	55,000.00	8	69	-80	157
16	Oct-10	60,000.00	6	53	-45	104
17	Nov-10	65,000.00	5	58	-24	86
18	Dec-10	66,000.00	2	28	-33	64
19	Jan-11	71,000.00	2	30	-28	61
20	Feb-11	76,000.00	2	27	-24	53
21	Mar-11	81,000.00	1	23	-22	46
22	Apr-11	86,000.00	2	23	-21	46
23	May-11	91,000.00	2	19	-20	41
24	Jun-11	96,000.00	5	22	-14	40
25	Jul-11	101,000.00	27	157	-177	360
26	Aug-11	106,000.00	13	64	-620	697
27	Sep-11	111,000.00	8	40	-403	451
28	Oct-11	116,000.00	6	36	-69	112
29	Nov-11	121,000.00	5	30	-50	85
30	Dec-11	126,000.00	3	23	-40	66
31	Jan-12	131,000.00	2	22	-36	60
32	Feb-12	136,000.00	1	20	-34	56
33	Mar-12	141,000.00	1	18	-30	50
34	Apr-12	146,000.00	1	16	-27	44
35	May-12	151,000.00	3	15	-19	36
36	Jun-12	160,000.00	3	18	-17	38
Total			275	1479	-2892	4646