

EFFECT OF PREPAID ELECTRICITY BILLING ON REVENUE  
COLLECTION COSTS AT KENYA POWER COMPANY

BY

RONALD ONTOMWA

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## DECLARATION

I declare that this research project report is my own original work and has never been submitted to any academic institution to be given credit.

| Name           | Signature | Date  |
|----------------|-----------|-------|
| Ronald Ontomwa | .....     | ..... |

This research project report has been submitted with my approval to the university supervisor

| <b>Supervisor</b>  | Signature | Date  |
|--------------------|-----------|-------|
| Dr. Kisaka Sifunjo | .....     | ..... |

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## **DEDICATION**

This project is dedicated to my family for support and encouragement and to Kenya Power Company.

## **ABSTRACT**

Kenya Power's electricity revenue is twofold: postpaid and prepaid. Sales made on credit exposes the business to credit risk and attract additional collection costs which may as well be eliminated if prepaid billing system was used. This study sought to establish whether this system affected revenue collection costs for Kenya Power. As Kenya Power converts more meters into prepaid, it is expected that it will enhance its revenue collection capabilities at the same time reduce costs associated with collection.

The researcher used a case study to assess the effect of prepaid billing on the company's revenue costs. Secondary data used was obtained from the company's Management Accounts and Financial Statements since prepaid meters were installed (2009) to the end of financial year 2013/14. A combination of observation, informal interviews and examination methods of data collection in documents and records were used to gather data from the company's databases. This was achieved by querying the company's financial systems through the use of appropriate system profiles. Statistical packages for social science (SPSS) were used as an aid to analysis. By use of regression models, the study anticipated an observable relationship between these variables.

The study established that with more installation of the number of prepaid meters revenue collection costs reduced. The study concluded that the use of prepaid billing system has reduced revenue collection costs for Kenya Power. It further recommends that Kenya Power should convert more meters into prepaid, as it will enhance its revenue collection capabilities at the same time reduce costs associated with collection.

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## **LIST OF ABBREVIATIONS**

|      |  |
|------|--|
| ARM  | Automatic Meter Reading                  |
| CS   | Customer Service                         |
| ECH  | Electricity Company of Ghana             |
| ICS  | Integrated Customer System               |
| ICT  | Information and Communication Technology |
| IPP  | Independent Power Producers              |
| KP   | Kenya Power                              |
| NSE  | Nairobi Stock Exchange                   |
| O&M  | Operation and Maintenance                |
| PPMs | Prepaid Meters                           |
| UK   | United Kingdom                           |

# **CHAPTER ONE**

## **INTRODUCTION**

### **1.1 Background to the study**

Successful modern business entities display the following attributes: innovativeness, quality of management, employee talent, quality of products and services, long-term investment value, financial soundness, social responsibility and use of corporate assets (Brigham, et al., 2005). Financial soundness entails efficiency and effectiveness in the management of an organization's revenues and costs. This calls for talented human resource in the organization which will bring in the much needed innovativeness in the way business is conducted. The use of modern technology is bound to change business operations either for better or worse and can affect the way a company manages costs that are associated with revenue collection.

Availability of adequate cash mainly from revenues to support business operations depends on organization's strategies on sales, cash collection and disbursements. Large holding of current assets especially cash strengthens firm's liquidity position and reduce riskiness, but also reduces overall profitability (Stephen, et al, 1999). Efficiency in revenue collection is critical for proper management of operational costs in any organization.

The concept of prepaid system is relatively new in Kenya. It was first implemented by companies in the communication industry (Safaricom and Airtel companies) before moving to other sectors of the economy. In these two firms, purchase of airtime or credit is made in advance before consumption. Some studies have been done in Kenya to show the efficacy of such as a system. Fewer have been replicated from the developed countries resulting from differences in economic levels, technology and cultural inclinations. None of the studies has

been done on their effect on revenue collection costs at Kenya Power. An organization such as Kenya Power has many operational activities that are elaborate and in need of large sums of cash outlay to support them, for example, O&M and CS departments. This requires proper operational strategies and techniques and high levels of revenue collection efficiencies in order improve on its bottom line.

### **1.1.1 Prepaid Electricity Billing**

According to Gomez and Contreras (2003), prepayment system refers to the outlay made by a consumer for using a good or service before consumption. Over the years, prepayment meters either in electricity, water or piped gas has been proposed as an innovative solution aimed at facilitating affordability and reducing utilities cost. This mechanism requires users pay in advance for the delivery of goods or services before consumption. In this way, consumers hold credit and then use the service until the credit is exhausted (Tewari and Tushaar, 2003).

When businesses make investment decisions, they must not only consider the finances required in acquiring the new machines, but also take account of the additional current assets that any expansion or activity will usually entail. A general increase in the scale of operations tends to imply a need for greater levels of cash (McLaney, 2009).

Prepaid billing technology has been embraced by both developed Western countries and developing ones. For instance, in the United Kingdom, there has been a long tradition of offering prepaid metering as an option to customers. By 2003 up to 15-20 percent of customers had signed up for the option (*Chartwell, The AMR Report, February 4, 2003*). Northern Ireland Electricity, which has a customer-friendly prepayment system, by the year 2005, had increased prepayment enrolment to 25 percent. More than 50,000 customers (about 6 percent) at Arizona's

Salt River Project were on prepaid meters by the year 2008 (*Chartwell, The AMR Report, February 4, 2003*).

In Africa, prepayment technology was first developed in South Africa in the late 1980s with the objective of supplying energy to a large number of low-income and geographically dispersed users. The system was initially geared towards minimizing the difficulties arising from users' irregular incomes and to overcome the limited development of the infrastructure required for the dispatch and reception of credit slips (Tewari & Shah, 2003).

### **1.1.2 Revenue Collection Costs**

Revenue can be collected manually or through technology. There are several administrative costs associated with manual revenue collection. For example, there is the risk of bad debts, revenue collection costs, monthly billing costs etc. All these operational costs have a direct impact on a firm's operational profits. Strategic introduction of technology in revenue collection is bound to eliminate some operational costs. This in turn may lead to improved revenue collection levels and cash flows.

Revenues that accrue to any organization involve incurring some costs that are in most cases operational in nature. Such costs to be incurred may be high or low depending on the level of technology in use in a given organization. This also has a direct impact on a firm's profits (Obura, et al., 2012). A typical company in an energy industry may incur costs such as debt collection costs, billing costs, reconnection and disconnection costs etc.

Most firms use the available technology to speed up cash collection because of the significance of such an element of working capital. A survey on how firms speed up cash collection on all-large firms in the UK showed that firms used lockbox systems to accelerate the process but more

than half of small firms avoided it due to associated high operating costs. This survey further reveals that to collate funds together for use, over one-half of all large firms use concentration banking, with wire transfers and depository transfer cheques being the primary means of moving funds from one bank to another (Gitman, 1986)

### **1.1.3 Prepaid Billing and Revenue Collection Costs**

Any business entity needs to adopt sound financial strategies in collecting revenues. Financial soundness entails efficiency and effectiveness in the management of an organization's revenues and costs. Efficiency in revenue collection is critical for proper management of operational costs in any organization (Brigham, et al., 2005). This will involve ability to maximize revenue collection at the same time minimize costs associated with revenue collection.

Prepaid billing system is a system where a service or a good is consumed after paying for it. Consequently, there are certain costs that may be avoided for billing in advance a given service or good. For instance, costs associated with bad debts. This may lead to increased levels of revenue as well as reduced some operational costs for a given organization (Ogujor and Otosowie, 2010). How an organization chooses to collect revenue largely depends on its management's strategies and capabilities (Gitman, 1986)

### **1.1.4 Kenya Power Company**

Kenya Power is a public utility company that is mandated by the Kenyan government to distribute electric power throughout the country. There are monopolistic tendencies in the power distribution since it is the sole distributor of electric power licensed by the government. The government is the major shareholder, controlling about 49% of shareholding. It is also a quoted

company whose shares are traded at NSE. For this reason it is required by law to publish annually accounts that are released to the public and other stakeholders for consumption.

The company relies heavily on hydro power and supplements with geo-thermal energy to generate electric power. It purchases energy from KenGen Company which is responsible for only generating electricity and sells the same to the public. During severe drought conditions when water levels in the dams drastically drop, it turns to Independent Power Producers (IPPs) that use fuel to generate power and sell it to the Kenya Power. The company has eight sub-regions that are semi-autonomous for better management and operation. The eight regions are: Nairobi, Coast, Central Rift, North Rift, Mount Kenya North, Mount Kenya South, West Kenya and Central Office.

Kenya Power Company has extensively embraced technology for strategic reasons such as enhancing operational efficiency and to be in tune with the modern business environment and also gain competitive edge in the business world (*Stima News, July-September 2010*). The nature of the company's operations are twofold: Engineering (technical) and financial or service. As a result, the company has adopted several systems for both engineering and finance so as to serve its customers better.

Since its inception in 1875, Kenya power has been on post-paid method of collecting revenue. The system entails allowing consumers to enjoy the service beforehand and pay later at the end of the month when billing has been done. As a result, the company has exposed itself to risks and costs associated with revenue collection. Such risks include meter reading costs, disconnection costs for timely non-payment of debt, bad debts for non-payment, meter tampering and establishment of a whole department with a cost centre and staff for managing debt.



All these costs have always exerted pressure on the company's revenues and profits since inception. The company has also grappled with issues arising from customer complaints due to estimated bills. Some meter readers are unable to read all their meters in their itinerary because of gated compounds or they are simply lazy and therefore end up estimating in order to achieve their set target. As a result, customer dissatisfaction arises which dents the company's public image in regard to efficiency and ability to deliver good customer service.

With the onset of modern technology, the company embarked on pre-paid pilot electricity program during the early years of the project. It is expected that revenue collection will increase astronomically as several costs associated with revenue collection will either reduce or be eliminated altogether. The company started retrofitting prepaid meters following a successful pilot in various parts of the country during which 174,000 meters were installed. The project was estimated to cost the company 5.8 billion shillings and targeted 520,000 customers countrywide. Besides adopting new technology in customer service, the company embarked on the prepaid metering system in 2009 with the aim of improving service delivery, cutting operation costs as well as reducing commercial losses associated with customer defaults (Obura, et al., 2012). It is now five years since implementation of the project.

The study will focus on the transition period when the company is gradually converting post-paid meters to prepaid meters and examine the number of prepaid meters being fitted and costs associated with revenue collection within that time span of about five years (some 60 months).

## **1.2 Statement of the Problem**

Kenya Power's electricity revenue is twofold: postpaid and prepaid. Sales are made either in cash or on credit. Adoption of prepaid billing system in revenue collection will eventually see the

company shift to a pre-paid system where customers will be required to purchase electricity in advance (Obura, et al., 2012). Hence, costs associated with revenue collection are likely to be reduced or eliminated altogether.

Sales made on credit exposes the business to credit risk and attract additional costs which may as well be eliminated if prepaid billing system was used. Additionally, electricity consumers face problems of being billed for bills that have already been paid. An organisation can adopt a prepaid system of collecting revenue to enhance its revenue collecting capabilities as well as eliminate some revenue collection costs. Kenya Power adopted prepaid billing for similar reasons. A survey by Ogujor and Otosowie (2010) in Nigeria reveals that introduction of the prepaid meters increases revenue collection but it also reduces revenue generation because it is reliability based.

Since inception of prepaid billing system project in 2009, it worth assessing the effects it has had on the company's revenue collection costs as was envisaged by the company's management. Efficient management of cash involves collecting debts as early as possible (shorter average collection period) and paying accounts payables as late as possible (longer average payables period) without damaging credit worthiness of the firm. A study by Gitman (1986) showed that some firms avoid a given system of collecting revenue due to associated high operating costs.

This study therefore sought to establish: has the use of prepaid billing system reduced revenue collection costs for Kenya Power? As Kenya Power converts more meters into prepaid, it is expected that it will enhance its revenue collection capabilities at the same time reduce costs associated with collection.

### **1.3 Objective of the Study**

To assess effect of prepaid billing on revenue collection costs at Kenya Power.

### **1.4 Importance of the Study**

The study purposes to show whether use of prepaid billing system will reduce costs associated with revenue collection as envisaged by the company's management. Reduced revenue collection cost will imply efficiency in revenue collection and improved cash flows for Kenya Power.

It also seeks to shed light on value of making major capital investment decisions beforehand. Capital investment decisions usually involve high cash outlay and are irreversible. Invariably, such decisions are long term by nature or their effects are long term. Decisions on change from post-paid system to a prepaid one involve employment of huge amounts of resources. In the case of Kenya Power, some 5.8 billion Kenyan shillings are expected to be laid out for this project (Obura, et al., 2012)

Before making similar investment decision, this study seeks justify such an investment and to boost levels of confidence among managers of organizations as to the viability of such a project. Other entities that may pursue prepaid billing system for their services or products may also get an idea whether the project is worth it.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter starts with a review of theoretical literature of the topic under study. Section 2.2 discusses theoretical literature. Section 2.2 discusses the theoretical literature. Section 2.3 discusses the empirical literature while section 2.5 is a summary of the literature review in the light of problem statement.

#### **2.2 Theoretical Literature**

Popular cash management theories tend to focus on how to improve on liquidity and reasons holding cash. Efficient management of cash involves collecting debts as early as possible (shorter average collection period) and paying accounts payables as late as possible (longer average payables period) without damaging credit worthiness of the firm (Soenen, 1993). For instance, there are several reasons for holding cash: to cover transaction needs; for precautionary motives; for speculative purposes; for compensatory reasons, among others (Brigham, et al., 2005). Cash balances are determined by the level of daily, weekly, and monthly inflows and outflows and although the generation process may be continuous, inflows are unpredictable and uneven, (Block and Hirt, 1992).

The prepaid billing system is considered efficient with minimal error based on electricity fixed base tariff price during periodic review. Customer billing processes play a critical role in revenue for a number of private and public sector organizations, including municipalities. In the delivery of public services, for example, billing drives cash flow and is the key source of information for customers using these services. In many countries, reforming billing processes, coupled with

strengthening collection processes, has improved revenue collection efficiency. Most of the evidence about the role of billing in revenue collection efficiency comes from the water sector (World Bank Report, 2012).

Some experts argue that billing systems based on consumption are more likely to be paid by individual users. In the water sector, this could take the form of universal adoption of water metering or spot-billing (Agarwal, 2008). Other measures to improve efficiency in revenue collection include computerizing customer databases and billing systems. Misra and King, (2012) noted that human handling should be eliminated from all billing processes to prevent fraud and billing errors.

Other experts have advocated for pre-payment as a means of increasing collections. This means that rather than billing after service consumption, it may be better to use pre-payment. This can ensure payments for services, as well as help households monitor and plan their expenditures. According to Blore *et al.*, (2004), this can be more important when providing services for poorer customers who may also benefit from the option of phased payments facilities and/or debt cancellation. Agarwal, (2008) adds that strict enforced disconnection policy for utilities to address those who default in making payments will also help ensure payment compliance.

Research done by World Bank on revenue collection revealed that the water utility of São Paulo of Brazil focused on improving the metering and billing of its prime 2% of customers who make up 34 per cent of revenue. Through installation of new meters, revenue increased by US\$ 72 million. Manila water utility in Philippines undertook a series of reforms between 2000 and 2003. The utility now employs 100% metering on all service connections, which are read monthly (World Bank, 2012).

## **2.3 Empirical Literature: International Studies**

Some other studies on the global stage have been done on efficiency in revenue collection its effect on profitability and other stakeholders. Moreover, similar surveys have been done on such studies and their impact on users and arrears in accounts receivable. For example, Ariel and Luciana (2008) state results of a survey conducted among local electricity users indicated that prepaid meters lead to 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.

Gitman (1986) did a study on how firms speed up cash collection how on all-large firms in the UK. The study showed that such firms used lockbox systems to accelerate the process but more than half of small firms avoided it due to associated high operating costs. This survey further reveals that to collate funds together for use, over one-half of all large firms use concentration banking, with wire transfers and depository transfer cheques being the primary means of moving funds from one bank to another. Their study also notes the key tool for managing cash disbursement is the zero-balance accounts which are centrally controlled. It was used by about 70% of large firms in the UK.

Ariel and Luciana (2008) did a cost benefit analysis of prepaid meters in South Africa and found 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 favourable change in social welfare, which expressed in 1996 constant prices reaches \$38 per user of electric 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 a significant loss generated by lower tax revenues related to changes in electricity consumption.

Salihu and Pamela (2010) did a research on evaluating the effect of ICT on development focusing on prepaid electricity billing in Nigeria by concentrating on the introduction of the prepaid 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 development activities and then derived some implications on economic development.

The study by Ogujor and Otosowie (2010) in Nigeria reveals that introduction of the prepaid meters increases revenue collection but it also reduces revenue generation because it is reliability based. Improving power reliability will increase revenue generation in the prepaid scenario. Prepaid meters ensure that consumers pay only for energy consumed and not the estimated bill in the post-paid system. The number of registered consumers in the first and second quarter of 2008 in Nigeria was 4,731,009 and 4,771,035 respectively, while prepaid meters installed were 93,134 and 99,317 respectively. The differential in registered customers between the two quarters is 40,026 and 6,183 respectively. One would have expected that differentials will at least be equal to the 40,026 newly registered post-paid customers. They attributed this phenomenon to dwindling revenue due to the dependence of the prepaid system on reliability of power resulting in the reduction of its installation.

Dadzie (2012) studied customers' perception and acceptability on the use of Prepaid Meter in Accra West Region of ECG. The main aim of this study was to improve customer acceptability by determining the level of acceptability of Prepaid Meters, analyze the factors customers

considers before accepting the use of Prepaid Meters, and determine management strategy in promoting prepaid usage. A descriptive method of research design adopted for the study. Both primary and secondary sources of data were used with questionnaire as the main instrument for collecting primary data on customer acceptability, factors customers perceive before accepting the use of prepaid meters. The stratified sampling method was used to categorize customers into the type of tariff whether domestic or commercial. A total sample size of 391 was drawn out of 18,000 customers in a district. He established that one of the major findings of the study is that customers consider a number of factors before accepting the prepaid meter for use and these include user friendliness of the prepaid meter, durability of the prepaid meter and access to prepaid meter vending points. He recommended that management should consider improving durability and access to prepaid meter vending points in order to improve customer acceptability on the use of prepaid meters.

## **2.4 Empirical Literature: Local Studies**

Some local researches have also been done on similar subject. 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 part of this study, the following parameters were analysed to determine the impact of the new billing system on loss reduction: the billing efficiency ratio is an important parameter based on which Umeme performance can be monitored. The billing efficiency ratio is defined as the total energy billed as against the total energy purchased in 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. This shows that there has been an improvement in customer billing.

Another related study was done by Mwaura (2010) 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 debts

Moki (2012) did a research on the relationship between prepaid electricity billing and working capital management in the Kenya Power company between 2009 and 2012. He used a three year period data and found that there exists both negative and positive relationship between prepaid billing system and working capital management in that prepaid billing has a significant negative relationship with average collection period. Average payment period and cash conversion cycle was found to have negative but non-significant relationship with prepaid billing system. His empirical findings conflicted with theoretical and general expectation that there is a positive non-significant relationship with regard to inventory turnover in days. He concluded that this system should initially be introduced as a means of revenue collection or debtor management until a significant number is achieved when the relationship with other working capital elements such as average payment period and cash conversion cycle are perfected.

Kioko (2013) conducted a study on perceived effects of prepaid meters on revenue collection efficiency at Kenya Power. She used a survey research design to establish effects of prepaid meters on revenue collection efficiency. 396 prepaid meters in Nakuru County were targeted. A sample of 201 respondents was selected using Stratified random sampling technique. The study

used primary data captured by use of questionnaires. Study findings indicated that perceived risk was negatively correlated to revenue collection, while perceived ease of use, perceived low cost and perceived usefulness were positively related and had a significant effect on revenue collection. This study therefore, affirms that perceived risk reduces revenue collection, while perceived ease of use, perceived low cost and perceived usefulness enhance revenue collection. She concluded that Kenya Power should enhance security of customers so that they do not suffer losses. Customer care service should increase their service delivery to customers so that users can have required knowledge on the use of prepaid meters. The use of prepaid meters should be improved since they improve management of daily power consumption of customers, advance the revenue collection process, save time and regulation of electricity consumption

Miyogo, et al. (2013) studied the effect of prepaid service transition in electricity bill payment on Kenya power customers. They conducted their survey in the West Kenya region. The purposes of the study were to determine employees and clients' response to the ongoing service transition from post-paid to pre-paid electricity bill payment, to assess key human resource requirements needed for successful transition from post-paid to pre-paid electricity bill payment and to investigate the KP's organizational strategies adopted towards the change. Stratified random sampling technique was used. Questionnaires were used as data collection instrument. The findings show that customers have embraced the pre-paid billing system and that prepaid billing system has brought with it some advantages like making them more careful with their consumption. The most influential human resource aspects necessary in promoting a successful transition from postpaid to prepaid electricity bill payment was having appropriate equipment for installing the prepaid meters. The study concluded that customers have embraced the prepaid billing system

## **2.5 Summary**

The concept of prepaid system is relatively new in Kenya. From the foregoing discussion above, several studies on the global stage have been carried out in reference to prepaid billing. However, few researches have been done in Kenya to show the efficacy of such as a system as shown in the review of local literature above. Evidently, while majority of global and local literature have concentrated on the qualitative aspects of prepaid, such as opinion and perceptions of the prepaid users and acceptability of the prepaid system, quantitative aspects of prepaid billing system have not been adequately explored. Hence no such research has been done on the effect of prepaid billing on revenue collection costs at all. This study therefore seeks to assess the effect prepaid billing has had on revenue collection costs at Kenya Power and disclose any link that may exist between these parameters.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter gives a brief definition of research methodology and provides a systematic description of research methodology that the researcher will employ. Section 3.2 discusses the research design. Section 3.3 discusses data and data collection methods. Section 3.4 discusses data analysis while sections 3.4.1 and 3.4.2 discuss the conceptual model and analytical model respectively. Finally, section 3.5 discusses data validity and data reliability.

Research methodology is the science of how research is done scientifically and the various steps that are generally adopted by the researcher in studying a research problem along with the logic behind them (Mugenda & Mugenda, 2003). It is the framework within which facts are placed so that the meaning can be extracted from them. This gives the direction that the research must follow in order to get issue of concern (Leedy, 1993).

#### **3.2 Research Design**

According to Robson (2002), research design provides answers for questions such as techniques used to collect data, sampling strategies and tools used and how time and cost restraints are dealt with. Research design is an arrangement of conditions for collection and analysis of data in a way that combines their relationship with purpose of the research. It is a means to achieve the research objectives through empirical evidence that is acquired economically (Chandran, 2004). The choice of a design is determined by the research purpose as described by the research problems and questions, categories of data needed, types of data and cost factors. The types of

research design include descriptive design, exploratory design, experimental design and observation design (Chandran, 2004).

The researcher used a case study to assess the effect of prepaid billing on the company's revenue costs. Mugenda and Mugenda (2003), states that a case study is an in depth investigation of individual institution or phenomena whose purpose is to determine the relationship that has been caused by a phenomenon of the study. The case study approach was adopted because of its ability to facilitate in depth study of the problem. According to Best and Kahn (1998), a case study probes deeply and analyses interactions between factors that explain present status or influence change or growth. The case study allowed the researcher to study selected issues, cases or events in details to explore and describe them. It allowed the researcher to study issues which occur in their natural settings where human behaviour occurs.

Cooper and Schindler (2003) states that in contrast to survey in which many people are studied, a case study is an in depth , intensive investigation of individuals or small groups of people or an organisation. The researcher deemed case study appropriate because Kenya Power is an entity which has been piloting prepaid system of collecting revenue since 2009 and would want to know whether this project has so far met one of the objectives of the company of reducing costs associated with revenue.

### **3.3 Data and Data Collection Methods**

#### **3.3.1 Data**

There are mainly two types of data: primary and secondary data. Primary data is also known as original data since it is collected for the first time by the person who is going to use it. The figures supplied as primary data are raw in form and they are to be arranged and organized later

on to be fit for use. Sources of primary data include surveys, interviews and observations. Secondary data is data that is already collected and exists before investigation starts. Sources of secondary data include books, reports of survey, official published data and magazines (Das, 1993). The researcher used both primary and secondary data in form of interviews and company journals respectively and other sources of data that were deemed relevant to the research. Data can also be qualitative or quantitative. The researcher used both qualitative and quantitative data because the information required was obtained from informal interviews and all relevant system based data on prepaid system.

Data collection is gathering empirical evidence in order to gain new insight about a situation answer questions that prompted the undertaking of the research. It involves operationalizing the research design into instruments of data collection in order to meet the research objectives (Bryman, 2001). In an ICT sector, the following techniques may be used to collect data: interview guides, observations, questionnaires and examination.

### **3.3.2 Interviews**

According to Mugenda and Mugenda (2003), an interview is an oral administration of a questionnaire or an interview schedule. According to Das (1993), interviews are suitable where the area of enquiry is limited and where emphasis is upon purity and where originality of data is to be kept secret. The advantages include originality, accuracy, elasticity given that the investigator can introduce changes that are deemed necessary; economical where the field of investigation is small. The investigator can also verify the accuracy of data because of the involvement in the collection process.

According to Das (1993), the disadvantages on the other hand include personal bias where data is influenced by subjective decisions. This method is also costly and time consuming as it requires personal investigation of a large number of people. This technique could be used in the subject under study to understand how the rate of conversion of meters from postpaid to prepaid has been in Kenya Power and any possible hitches in the process

### **3.3.3 Observation**

Observation is the systematic noting and recording of events as they occur in specific locations (Daymon & Holloway, 2004). According to Mugenda and Mugenda (2003), a researcher uses an observation checklist to record what he she observes during data collection.

The researcher must define the behaviors to be observed and develop a detailed list of behaviors during data collection. The researcher checks off each behavior as it occurs.

### **3.3.4 Questionnaire**

A questionnaire is a form in which individuals respond to written items. Questionnaires ask people to report their understanding of things often including their own behavior According to Das, (1993); questionnaires are one of the largest used methods of data collection. It is generally used when data is to be collected at a large scale, the field of investigation is very large, the investigator has limited financial resources and the informants are educated. The other advantage include less error because the informants supply information, and originality because informants are directly involved in supply of information.

The disadvantages of questionnaire include lack of interest on the part of informants owing to the large number of questions, personal bias exists or complexity of questions may lead to wrong

information. This method is inelastic since no alteration may be introduced. This technique of data collection may be inappropriate in case studies like the one under study.

This study used secondary data which was obtained from the company's Management Accounts and Financial Statements since prepaid meters were installed (2009) to the end of year 2013. Since the study mainly used secondary data, a combination of observation, informal interviews and examination methods of data collection in documents and records were used to gather data from the company's databases. This was achieved by querying the company's financial systems through the use of appropriate system profiles.

#### **3.3.4.1 Data Collection Procedures**

The researcher sought authority from Kenya Power's relevant functionality before examining data for the subject under study. This involved making a formal written application seeking permission from the company management to conduct the study.

Data collection operations were conducted by the researcher with the help of colleagues with relevant system profiles wherein data for the study reside.

### **3.4 Data Analysis**

Data analysis is the process of bringing order to structures and interpretation to the mass of collected data (Marshall and Rossman, 1999). Statistical packages for social science (SPSS) were used as an aid to analysis.

This package was preferred because it has the ability to cover a variety of statistical and graphical data analysis in a systematic manner. By use of regression models, the study anticipated an observable relationship between these variables.



### 3.4.1 Conceptual Model

Miles and Huberman (1994), indicate that a conceptual framework explains either graphically or in a narrative form, the main issue to be studied. A conceptual framework covers the main features of the study and their presumed relationship (Robson, 2002). 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 analysed. This study was undertaken to assess the effect of prepaid billing on the company's revenue collection costs. Revenue collection costs the dependent variable while number of prepaid meters under prepaid billing system independent variable.

$$Y=f(X) \quad (1)$$

Where

Y= Revenue Collection Costs

X =Number of Prepaid Meters under prepaid billing System

The expected theoretical relations were as follows: revenue collection costs are expected to relate negatively the number of prepaid meters under prepaid billing system. This is in agreement with Ariel and Luciana (2008) that such a system is linked to the reduction of operational costs on the part of the service provider and to a better allocation of resources for the user. Moderating variables included lack of policy and strategy in prepayment system and government policy while intervening variables are nature of prepaid meters, meter tampering, corruption indices and meter inspection, off supply revenue loss as well as stability of technology supporting prepaid meters.

### 3.4.2 Analytical Model

$$Y = \beta_0 + \beta X + \varepsilon \quad (2)$$

Where

Y=Revenue Collection Costs

X= Number of Prepaid Meters under prepaid billing System

$\beta_0$ = Y intercept

$\beta$ =coefficient

$\varepsilon$  = Error term of the model

To test the relationship between the variables, the study adopted both descriptive and inferential analysis. The inferential statistical procedures to be used in this study are correlation coefficient ( $r$ ) and Pearsonian correlation coefficient. The tests of significance to be used are regression analysis expected to yield the coefficient of determination ( $R^2$ ), analysis of variance along with the relevant  $t$  – tests,  $f$  -tests,  $z$  – tests and  $p$  – values. The choices of these techniques were guided by the variables, sample size and the research design. The inferential statistical techniques were done at 95% confidence level ( $\alpha = 0.05$ ). The data was analyzed using the Statistical Package Social Sciences Software (SPSS). Quantitative data was used to present results in form of graphs and tables.

### 3.5 Data Validity and Data Reliability

Secondary data used in the study was obtained from the company's Management Accounts and Financial Statements since prepaid meters were installed (2009) to the end of year 2013, that is, some five years of study. Other Relevant company publications such as quarterly newsletters and

business journals both from without and within and the company were also examined for the study.

The reason for using this data was that it is recent and can easily be obtained because it has not been archived. It was also within the period under review by the study. It could also be relied upon given its source and objectivity. The data was reliable because it is computer processed and has been subjected to both internal and external audit and proved to be valid. Kenya Power accounting system is based on monthly cycles which are regularly closed or locked once posting has been done to prevent further unauthorized posting or manipulation.

## CHAPTER FOUR

### DATA ANALYSIS AND INTERPRETATION

#### 4.1 Introduction

This chapter presents data analysis and interpretation. Section 4.2 provides a summary of statistics, section 4.3 deals with the analytical model, and section 4.4 discussions of results while section 4.5 provides the summary.

#### 4.2 Summary of Statistics

##### 4.2.1 Averages of key statistics

Statistics on the number of prepaid meters under billing system and the revenue collection costs were calculated on an annual average on the year between 2009 and 2014. The data is presented in table 4.1 below.

**Table 4.1: Annual averages**

| Year      | Number of Prepaid Meters under prepaid billing System (mean) | Std. deviation | Revenue collection costs | Std. deviation |
|-----------|--|----------------|--------------------------|----------------|
| 2009-2010 | 22,250   | 12388.59       | 2,369,164                | 234,863.15     |
| 2010-2011 | 70,167   | 16297.42       | 2,295,340                | 268,868.24     |
| 2011-2012 | 128,833  | 18610.03       | 2,273,466                | 202,403.59     |
| 2012-2013 | 290,000  | 72111.03       | 2,129,455                | 488,957.95     |
| 2013-2014 | 530,000  | 72111.03       | 1,929,251                | 380,683.11     |

Source: Research findings

From the findings as depicted by the study period, there was an average rise in the number of prepaid meters under prepaid billing system for the five year period from 22,250 in 2009 to

530,000 in 2014 accompanied by a fall in average yearly revenue collection costs. In addition, the high standard deviation is an indication that there were high variations in meter installations. Also, it can generally be deduced that with more installation in the number of prepaid meters under prepaid billing system the revenue collection costs (For instance, costs associated with bad debts as well as operational costs) dropped. Further, the findings depicted a trend of change in mean value from 2.3 million in 2009 to 1.9 million in 2014 with standard deviations, indicating variation in Revenue collection costs for the study period.

### **4.3 Analytical Model**

This section provides the correlation analysis and the regression analysis to show the relationship between the variables that is number of prepaid meters under prepaid billing system and revenue collection costs.

#### **4.3.1 Correlation Analysis**

To quantify the strength of the relationship between the variables, the study used Karl Pearson's coefficient of correlation. The Pearson product-moment correlation coefficient (or Pearson correlation coefficient for short) is a measure of the strength of a linear association between two variables and is denoted by  $r$ . The Pearson correlation coefficient,  $r$ , can take a range of values from +1 to -1.

A value of 0 indicates that there is no association between the two variables. A value greater than 0 indicates a positive association, that is, as the value of one variable increases so does the value of the other variable. A value less than 0 indicates a negative association, that is, as the value of one variable increases the value of the other variable decreases. Pearson's Correlation Coefficient was carried out and the results obtained are presented in table 4.2 below.

**Table 4.2: Pearson’s Correlation Coefficient Matrix**

|  |                     |   |
|--|---------------------|---|
|  |                     | Number of Prepaid Meters under prepaid billing System |
| Revenue collection costs                                     | Pearson Correlation | -.445**   |
|  | Sig. (2-tailed)     | .000  |
|  | N                   | 60  |
| **. Correlation is significant at the 0.01 level (2-tailed). |                     |   |

Source: Research findings

Results from table 4.2 above reveal that there is a significant negative relationship between Number of Prepaid Meters under prepaid billing System and Revenue collection costs ( $r = -.445^{**}$ ,  $P\text{-value} < 0.01$ ). This implies that with more installation of Prepaid Meters under prepaid billing System, the Revenue collection costs are reduced. In addition, regression analysis was conducted.

### 4.3.2 Regression Analysis

In this section, regression analysis was conducted for which natural log of values was applied in order to minimize the errors in the analysis.

**Table 4.3 Model Summary**

| Model  | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
|--|-------------------|----------|-------------------|----------------------------|
| 1  | .445 <sup>a</sup> | .198     | .185              | .247                       |
| a. Predictors: (Constant), Number of Prepaid Meters under prepaid billing System |                   |          |                   |                            |

Source: Research findings

In this case, the coefficient of determination (the percentage variation in the dependent variable being explained by the changes in the independent variables)  $R^2$  equals 0.198, that is, number of

prepaid meters under prepaid billing System explain 19.8 percent of the variance in revenue collection costs.

**Table 4.4: Analysis of Variance**

| Model      | Sum of Squares | df | Mean Square | F     | Sig.              |
|------------|----------------|----|-------------|-------|-------------------|
| Regression | 0.062          | 1  | 0.062       | 11.77 | .000 <sup>a</sup> |
| Residual   | 0.308          | 58 | 0.005       |       |                   |
| Total      | 0.370          | 59 |             |       |                   |

a. Dependent variable: revenue collection costs

Source: Research findings

In this case, the significance value of the F statistic is 0.000 indicating that the predictor variables (number of prepaid meters under prepaid billing system) explain a variation in revenue collection costs and that the overall model is significant.

**Table 4.5: Coefficients**

| Model   | Unstandardized Coefficients |            | Standardized Coefficients | t      | Sig. |
|---|-----------------------------|------------|---------------------------|--------|------|
|   | B                           | Std. Error | Beta                      |        |      |
| (Constant)  | 6.64                        | 0.089      |                           | 74.26  | .000 |
| Number of Prepaid Meters under prepaid billing System | -0.06                       | 0.017      | -.445                     | -3.431 | .000 |

Source: Research findings

Based on regression coefficients results the regression equation can be written as follows;

$$Y = 6.64 - .06X$$

Regression analysis reveals the extent to which number of prepaid meters under prepaid billing System significantly predicted revenue collection costs. The findings indicate that a change in the number of prepaid meters under prepaid billing system results in 0.06 unit decrease in revenue collection costs. The findings recommend that to achieve a proper reduction in revenue collection costs, Kenya Power Company need install more prepaid meters under prepaid billing system.

#### **4.4 Discussion**

The results revealed that there is a significant negative relationship between number of prepaid meters under prepaid billing system and revenue collection costs ( $r = -.445^{**}$ ,  $P\text{-value} < 0.01$ ). This implies that with more installation of prepaid meters under prepaid billing system, the revenue collection costs are reduced. This finding concurs with results from a survey conducted by Casarin and Nicollier (2009) that prepaid meters lead to an increase in welfare and reduces arrears in accounts receivables and that of operational and financial costs on the part of the service provider and enhances allocation of resources. Therefore, consumers are able to control their budget and obtain full transparency of consumption.

The findings also revealed that a change in the number of prepaid meters under prepaid billing system results in 0.831 unit decrease in revenue collection costs. Lastly, the study findings recommend that to achieve a proper reduction in revenue collection costs, Kenya Power Company need install more Prepaid Meters under prepaid billing System. This is in agreement with Averweg and Roldán (2006) who notes that the prepaid metering system is a new billing



approach in the energy sector that includes a superior electronic customer accounts management system. It integrates metering equipment with smartcard technology. It not only provides a utility but also substantial savings in manpower and money, while providing new payment options for customers. It reduces operational costs because it applies paperless revenue collection system and can replace any electromechanical meter in the market.

#### **4.5 Summary**

The study established that with more installation in the number of prepaid meters under prepaid billing system the revenue collection costs (for instance, costs associated with bad debts as well as operational costs dropped)

The study revealed that there is a significant negative relationship between number of prepaid meters under prepaid billing system and revenue collection costs. This implied that with more installation of prepaid meters under prepaid billing System, the revenue collection costs are reduced. In addition, regression analysis was conducted.

Regression analysis revealed the extent to which number of prepaid meters under prepaid billing System significantly predicted the revenue collection costs. The study further revealed that the predictor variables (number of prepaid meters under prepaid billing system) explain a variation in revenue collection costs and that the overall model is significant.

The study affirms that prepaid billing has a significant effect on revenue collection costs at Kenya Power. From the study findings, there is enough support that prior payment of prepaid meter enhances revenue collection efficiency.

The study finally found that a change in the number of prepaid meters under prepaid billing system results in a significant decrease in revenue collection costs.

## **CHAPTER FIVE**

### **SUMMARY AND CONCLUSION**

#### **5.1 Introduction**

This chapter presents summary of findings, conclusion and recommendations. Section 5.2 provides the summary of the study, section 5.3, the conclusion, and section 5.4, limitations of the study while section 5.5 presents recommendations for further research.

#### **5.2 Summary of the Study**

The key objective of the study was to assess effect of prepaid billing on revenue collection costs at Kenya Power. The researcher used a case study to assess the effect of prepaid billing on the company's revenue costs.

This study used mainly secondary data which was obtained from the company's Management Accounts and Financial Statements since prepaid meters were installed (2009) to the end of year 2013. Since the study mainly used secondary data, a combination of observation, informal interviews and examination methods of data collection in documents and records were used to gather data from the company's databases.

This was achieved by querying the company's financial systems through the use of appropriate system profiles. Statistical packages for social science (SPSS) were used as an aid to analysis. By use of regression models, the study anticipated an observable relationship between these variables

The study established that with more installation in the number of prepaid meters under prepaid billing system the revenue collection costs (For instance, costs associated with bad debts as well as operational costs dropped).

The study revealed that there is a significant negative relationship between number of prepaid meters under prepaid billing system and revenue collection costs. This implied that with more installation of prepaid meters under prepaid billing system, the revenue collection costs are reduced. In addition, regression analysis was conducted.

Regression analysis revealed the extent to which number of prepaid meters under prepaid billing system significantly predicted the revenue collection costs. The study further revealed that the predictor variables (number of prepaid meters under prepaid billing system) explain a variation in revenue collection costs and that the overall model is significant.

The study finally found that a change in the number of prepaid meters under prepaid billing system results in a significant decrease in revenue collection costs.

### **5.3 Conclusions**

The study concludes that the use of prepaid billing system has reduced revenue collection costs for Kenya Power within the five year period they have been installed. Thus, Kenya Power should convert more meters into prepaid as well as retrofit the already installed meters on post-paid, as it will enhance its revenue collection capabilities at the same time reduce costs associated with collection.

## **5.4 Limitations of the Study**

As it has always been with most academic activities this research is not without limitations. Some of the limitations encountered during the entire research period are outlined below.

The study area was limited to the Kenya Power Company only and this could affect the generalizations of the findings.

While the purpose of the study is to find out the effect of prepaid billing on revenue collection costs at Kenya Power, the study does not attempt to explain why such a change might have occurred.

## **5.5 Recommendations for further Research**

The findings recommend that to achieve proper reduction in revenue collection costs, Kenya Power Company need install more prepaid meters under prepaid billing system. Prepaid energy meter is used to improve the operational efficiency as there is no need of men for meter reading. The disconnection & reconnection is automatic. It can help to control appropriation of electricity in a better way than traditional metering.

As the payment is online/by recharge voucher, it improves the cash flows and also improved revenue management system, which will reduces the financial risk. Customer service is also improved by using this. By the use of prepaid energy meter the billing delay and extra cost due to disconnection/reconnection can be removed and we can use the electrical energy in a controlled manner which helps the consumer to save their money through better energy management.

Due to increase in the need of electrical power, there have been calls for deregulation of power distribution market to allow for more distributors of electric power so as to enhance efficiency and customer service levels. This is bound to increase the level of competition thus driving the prepaid market in Kenya.

Metering errors, tampering with meters both in post-paid and prepaid billing systems belong to non-technical losses which lead to low revenue collection while increasing revenue collection costs. In Kenya, this is a pronounced phenomenon that requires sufficient attention from management. There are other challenges such as dissatisfaction from customers already on prepaid system about adequacy of the system and sporadic upsurge of prepaid bills upon recharge.

It is important to note that only about 30 per cent of prepaid meters have been installed by the time of this study was being carried out and effects of tampering and subsequent inspections may not have had a significant impact on the overall revenue collection costs and cash flows for Kenya power. It is therefore suggested that further study be conducted after the company has attained at least 75 per cent mark prepaid meter installation so as to determine the true impact on revenue collection costs and other operational costs.

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## Appendices

### Appendix 1: Data Collection Instruments

#### Letter of introduction

Ronald Ontomwa

D61/847272/2012

School of Business

University of Nairobi

14<sup>th</sup> July 2014

To,

Training and Development Manager,

Kenya Power

Dear Sir,

**REF: EFFECT OF PREPAID ELECTRICITY ON REVENUE COLLECTION COSTS AT KENYA POWER COMPANY**

I am an MBA student at the University of Nairobi currently doing a study on “Effect of Prepaid Electricity on Revenue Collection Costs at Kenya Power Company”. My area of specialization is Finance Option and I would like to examine the effect the prepaid system has had on the company’s revenue collection costs since inception (2009) to date. I therefore request to be granted permission to conduct the research which will strictly be for academic purposes and results thereof shall remain confidential.

Attached is a copy of the University letter confirming and authorizing me to proceed with the study.

Thanking you in advance for cooperation and support

Yours truly,

Ronald Ontomwa

## Appendix 2: Data Collection Form

| Period | PPMs | Cost centers |       |              |            |                |                |            |
|--------|------|--------------|-------|--------------|------------|----------------|----------------|------------|
|        |      | NAIROBI      | COAST | CENTRAL RIFT | WEST KENYA | MT KENYA NORTH | MT KENYA SOUTH | NORTH RIFT |
| Jun-14 |      |              |       |              |            |                |                |            |
| May-14 |      |              |       |              |            |                |                |            |
| Apr-14 |      |              |       |              |            |                |                |            |
| Mar-14 |      |              |       |              |            |                |                |            |
| Feb-14 |      |              |       |              |            |                |                |            |
| Jan-14 |      |              |       |              |            |                |                |            |
| Dec-13 |      |              |       |              |            |                |                |            |
| Nov-13 |      |              |       |              |            |                |                |            |
| Oct-13 |      |              |       |              |            |                |                |            |
| Sep-13 |      |              |       |              |            |                |                |            |
| Aug-13 |      |              |       |              |            |                |                |            |
| Jul-13 |      |              |       |              |            |                |                |            |
| Jun-13 |      |              |       |              |            |                |                |            |
| May-13 |      |              |       |              |            |                |                |            |
| Apr-13 |      |              |       |              |            |                |                |            |
| Mar-13 |      |              |       |              |            |                |                |            |
| Feb-13 |      |              |       |              |            |                |                |            |
| Jan-13 |      |              |       |              |            |                |                |            |
| Dec-12 |      |              |       |              |            |                |                |            |
| Nov-12 |      |              |       |              |            |                |                |            |
| Oct-12 |      |              |       |              |            |                |                |            |
| Sep-12 |      |              |       |              |            |                |                |            |
| Aug-12 |      |              |       |              |            |                |                |            |
| Jul-12 |      |              |       |              |            |                |                |            |
| Jun-12 |      |              |       |              |            |                |                |            |
| May-12 |      |              |       |              |            |                |                |            |
| Apr-12 |      |              |       |              |            |                |                |            |
| Mar-12 |      |              |       |              |            |                |                |            |
| Feb-12 |      |              |       |              |            |                |                |            |
| Jan-12 |      |              |       |              |            |                |                |            |
| Dec-11 |      |              |       |              |            |                |                |            |
| Nov-11 |      |              |       |              |            |                |                |            |
| Oct-11 |      |              |       |              |            |                |                |            |
| Sep-11 |      |              |       |              |            |                |                |            |
| Aug-11 |      |              |       |              |            |                |                |            |
| Jul-11 |      |              |       |              |            |                |                |            |
| Jun-11 |      |              |       |              |            |                |                |            |
| May-11 |      |              |       |              |            |                |                |            |
| Apr-11 |      |              |       |              |            |                |                |            |
| Mar-11 |      |              |       |              |            |                |                |            |
| Feb-11 |      |              |       |              |            |                |                |            |
| Jan-11 |      |              |       |              |            |                |                |            |
| Dec-10 |      |              |       |              |            |                |                |            |
| Nov-10 |      |              |       |              |            |                |                |            |
| Oct-10 |      |              |       |              |            |                |                |            |
| Sep-10 |      |              |       |              |            |                |                |            |
| Aug-10 |      |              |       |              |            |                |                |            |
| Jul-10 |      |              |       |              |            |                |                |            |
| Jun-10 |      |              |       |              |            |                |                |            |
| May-10 |      |              |       |              |            |                |                |            |
| Apr-10 |      |              |       |              |            |                |                |            |
| Mar-10 |      |              |       |              |            |                |                |            |
| Feb-10 |      |              |       |              |            |                |                |            |
| Jan-10 |      |              |       |              |            |                |                |            |

|        |  |  |  |  |  |  |  |  |
|--------|--|--|--|--|--|--|--|--|
| Dec-09 |  |  |  |  |  |  |  |  |
| Nov-09 |  |  |  |  |  |  |  |  |
| Oct-09 |  |  |  |  |  |  |  |  |
| Sep-09 |  |  |  |  |  |  |  |  |
| Aug-09 |  |  |  |  |  |  |  |  |
| Jul-09 |  |  |  |  |  |  |  |  |



**Appendix 3: Raw data: Number of prepaid meters and revenue collection costs**

| <b>Cost centers</b> | <b>No. of prepaid Meters</b> | <b>revenue collection costs</b> |
|---------------------|------------------------------|---------------------------------|
| <b>Period</b>       |                              | <b>KSH</b>                      |
| Jun-14              | 640,000                      | 1,854,500.00                    |
| May-14              | 620,000                      | 1,997,020.00                    |
| Apr-14              | 600,000                      | 1,378,660.00                    |
| Mar-14              | 580,000                      | 1,800,000.00                    |
| Feb-14              | 560,000                      | 1,839,220.00                    |
| Jan-14              | 540,000                      | 1,900,000.00                    |
| Dec-13              | 520,000                      | 1,879,625.00                    |
| Nov-13              | 500,000                      | 1,798,071.00                    |
| Oct-13              | 480,000                      | 1,336,125.00                    |
| Sep-13              | 460,000                      | 2,270,800.00                    |
| Aug-13              | 440,000                      | 2,542,995.00                    |
| Jul-13              | 420,000                      | 2,554,000.00                    |
|                     |                              |                                 |
| Jun-13              | 400,000                      | 2,650,180.00                    |
| May-13              | 380,000                      | 2,717,115.00                    |
| Apr-13              | 360,000                      | 2,312,305.00                    |
| Mar-13              | 340,000                      | 1,930,800.00                    |
| Feb-13              | 320,000                      | 2,283,360.00                    |
| Jan-13              | 300,000                      | 2,165,775.00                    |
| Dec-12              | 280,000                      | 1,172,504.00                    |
| Nov-12              | 260,000                      | 1,211,830.00                    |
| Oct-12              | 240,000                      | 2,095,195.00                    |
| Sep-12              | 220,000                      | 2,464,895.00                    |
| Aug-12              | 200,000                      | 2,304,500.00                    |
| Jul-12              | 180,000                      | 2,245,000.00                    |
|                     |                              |                                 |
| Jun-12              | 160,000                      | 2,264,157.00                    |
| May-12              | 151,000                      | 2,200,000.00                    |
| Apr-12              | 146,000                      | 2,307,726.00                    |
| Mar-12              | 141,000                      | 2,190,788.00                    |
| Feb-12              | 136,000                      | 2,139,330.00                    |
| Jan-12              | 131,000                      | 2,106,061.00                    |
| Dec-11              | 126,000                      | 2,737,792.00                    |
| Nov-11              | 121,000                      | 2,559,064.00                    |
| Oct-11              | 116,000                      | 2,335,171.00                    |

|        |         |              |
|--------|---------|--------------|
| Sep-11 | 111,000 | 2,063,200.00 |
| Aug-11 | 106,000 | 2,315,098.00 |
| Jul-11 | 101,000 | 2,063,200.00 |
|        |         |              |
| Jun-11 | 96,000  | 2,409,404.00 |
| May-11 | 91,000  | 2,016,578.00 |
| Apr-11 | 86,000  | 2,091,800.00 |
| Mar-11 | 81,000  | 2,306,730.00 |
| Feb-11 | 76,000  | 2,063,500.00 |
| Jan-11 | 71,000  | 2,139,812.00 |
| Dec-10 | 66,000  | 2,063,134.00 |
| Nov-10 | 65,000  | 2,910,192.00 |
| Oct-10 | 60,000  | 2,190,848.00 |
| Sep-10 | 55,000  | 2,281,060.47 |
| Aug-10 | 50,000  | 2,420,336.00 |
| Jul-10 | 45,000  | 2,650,680.00 |
|        |         |              |
| Jun-10 | 40,000  | 2,668,344.00 |
| May-10 | 35,000  | 2,569,263.00 |
| Apr-10 | 33,000  | 2,300,740.00 |
| Mar-10 | 31,000  | 2,452,936.00 |
| Feb-10 | 29,000  | 2,221,820.00 |
| Jan-10 | 27,000  | 2,205,600.00 |
| Dec-09 | 25,000  | 2,123,873.00 |
| Nov-09 | 17,000  | 2,200,576.00 |
| Oct-09 | 12,000  | 2,122,845.00 |
| Sep-09 | 9,000   | 2,191,380.00 |
| Aug-09 | 6,000   | 2,553,934.00 |
| Jul-09 | 3,000   | 2,818,660.00 |



