

DECLARATION AND RECOMMENDATION

DECLARATION

This research project is my original work and has not been presented for examination in any other Institution or University.

Sign.....

Date.....

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GMB-NE-0239-01-12

RECOMMENDATION

This project has been presented for examination with our recommendation as University supervisors.

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DEDICATION

This research project is dedicated first to God for the strength He gave me to carry on, to my family, my husband and my daughter for their support and encouragement throughout the period of undertaking the project, and to my dad for always believing in me.

ACKNOWLEDGEMENT

I express my gratitude to the Almighty God for the strength and good health that He provided while I was working on this research.

I wish to extend my sincere gratitude to my supervisors, Dr. Maina Waiganjo and Dr. Symon Kiprop for the invaluable support and guidance they offered me while I was preparing this report. I wish to acknowledge Mr. Owili for his support in statistical analysis.

I wish to posthumously acknowledge the late Dr. Jesse W. Mwangi for his encouragement and guidance when I commenced on the project. May God rest his soul in peace.

I also acknowledge the financial and emotional support I received from my dear husband. Thanks for your patience and understanding even when I had to work long hours.

Lastly, I wish to acknowledge my dad for his immense support, encouragement and for believing in me.

ABSTRACT

Among the challenges hindering energy provision is the loss of revenue as a result of poorly managed revenue collection systems. This study examined the effect of prepaid meters on revenue collection, a case of Kenya power, Nakuru, Kenya. The study 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. Data was analysed using both Descriptive and Inferential Statistics with the aid of Statistical Package for Social Sciences (SPSS) version 20. Descriptive Statistics used included mode, percentages and frequencies. For inferential statistics, Pearson Correlation and Multiple Regression were used. The findings were presented in form of tables. Study findings indicated that perceived risk was negatively correlated to revenue collection ($\beta_1 = -.182$, $\rho < 0.05$), while perceived ease of use ($\beta_2 = 0.342$, $\rho < 0.05$), perceived low cost ($\beta_3 = .823$, $\rho < 0.05$) and perceived usefulness ($\beta_4 = 0.131$, $\rho < 0.05$) 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. The Kenya Power company 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.

Key Words

Revenue Collection efficiency, prepaid meters, Kenya power limited, Perceived risk,

Perceived ease of use, Perceived cost and Perceived usefulness.

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LIST OF ABBREVIATIONS

TAM: Technology acceptance model

PU: perceived use

PEU: Perceived ease of use

PHCN: Power Holding Company of Nigeria

OECD: Organization for Economic Cooperation and Development

IT: Information Technology

CHAPTER ONE

INTRODUCTION

1.1 Overview of the Chapter

This chapter discusses the background of the study, statement of the problem, objectives of the study, the research questions, significance of the study, limitation of the study, the scope of the study and the conceptual framework.

1.2 Background to the Study

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 (Hangzhou Pax Electronic Technology, 2012).

Globally, there has been an increase in the number of customers preferring to use prepaid meters. For instance, in the United Kingdom, there has been a long tradition of offering prepaid metering as an option to customers. Up to 15-20 percent of customers have signed up for the option (Chartwell, 2003). Northern Ireland Electricity, which has a customer-friendly prepayment system, has increased prepayment enrolment to 25 percent (Energy watch, 2005). At Arizona's Salt River Project, more than 50,000 customers (about 6 percent) are on prepaid meters (Chartwell, 2008). In Ontario, Woodstock Hydro reports that 25 percent of residential customers have opted to use the prepaid system.

According to Chartwell (2003), the United Kingdom adoption of prepaid meters has considerably increased their revenue collection efficiency and reduced overheads, hence leading to increased profitability. Northern Ireland Electricity reports that customers on prepaid method use 4.9% less electricity than the average customer. By the late 1990s, prepayment systems were very popular in India and in some OECD countries (Estache *et al.*, 2000). It is probable that they had reached their highest development in Great Britain (Waddams *et al.*, 1997).

In Africa, prepayment technology was initially 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).

While consumer adoption of prepaid meters has been increasing in the continent, it has been revealed that most energy supply companies have huge debts owed by customers. This inhibits their revenue collection efficiency as well as the provision of quality service. To address this problem, some companies resorted to adoption of the network operator cash collection policy called Revenue Cycle Management (RCM) that involves using private companies in the collection of monies owed (Annon, 2001). Since this seemed not to yield the expected results, Power Holding Company e.g. Nigeria (PHCN) introduced the digital pre-paid meter in 2006 whose operation is similar to the loading of a recharge card in the Global System for Mobile communication handset.

Such a system has been introduced in Kenya. Some 123,000 prepaid meters had been installed throughout the country by June 30, 2012, with a majority of them fitted in Nairobi households. The installation project was slowed down to address pertinent issues such as consumer education, logistics, and faulty meters. However, the expectations have not come true for all customers. There have been complaints by some customers that this prepaid system is not as efficient as the former method. According to Kenya Federation of Consumers, (2012) faulty gadgets, poor consumer knowledge on how to use the new technology and confusing billings irked some consumers. Several households using prepaid meters across the county elicited mixed reactions. While some users testify that the meters save electricity and costs, others have expressed dissatisfaction, citing various concerns. However, in a bid to counter the ignorance surrounding pre-paid meters, Kenya Power has embarked on an intensive customer education about tariffs, particularly the domestic tariff (East Africa Reporter, 2012).

Nakuru is one of the towns where commercial and domestic users have been installed with prepaid meters. The first connections were done in the town Centre within a radius of 5 kilometers. Challenges were similar to those experienced in other regions of the country, especially Nairobi. However, commercial customers who understood it preferred it over the postpaid billing system which they said was expensive and had lots of hidden charges. The installation project has however been revived and currently Nakuru handles over 11,000 customers who have been connected to the pre-paid meters (Kenya Power Monthly Publication, 2013).

1.3 Statement of the Problem

According to Kenya Power Annual Report (2009), the postpaid system has been blamed for very many customer complaints. In addition, energy provision companies are unable to keep track of the changing demand for domestic consumers as some consumers face problems of being invoiced for bills that have already been paid as well as poor reliability of electricity supply. Kenya Power adopted prepaid metering to improve revenue collection efficiency. However, this has not been achieved since revenue collection efficiency that can be related to the prepaid system has not increased significantly (Kenya Power Monthly Report, 2013). It is not known whether the perception of risk, ease of use, cost and perceived usefulness in the prepaid metering system can be responsible for the challenges in improving revenue collection efficiency. This study therefore sought to establish the perceived effect of prepaid meters adoption on revenue collection efficiency.

1.4 Objectives of the Study

The general objective of this study was to investigate the perceived effects of prepaid meters on revenue collection efficiency in Kenya Power Limited, Nakuru.

1.4.1 Specific Objectives

The study was guided by the following specific objectives:

1. To establish the effect of perceived risk of prepaid meters on revenue collection efficiency in Kenya Power, Nakuru.
2. To ascertain the effect of perceived ease of use of prepaid meters on revenue collection efficiency in Kenya Power, Nakuru.

3. To determine the effect of perceived cost of prepaid meters on revenue collection efficiency in Kenya Power, Nakuru.
4. To determine perceived usefulness of prepaid meters on revenue collection efficiency in Kenya Power, Nakuru.
5. To determine the composite influence of perceived risk, perceived ease, perceived cost, and perceived usefulness of prepaid meters on revenue collection efficiency in Kenya Power, Nakuru.

1.5 Research Hypotheses

H₀₁: Perceived risk has no significant effect on revenue collection efficiency

H₀₂: Perceived ease of use has no significant effect on revenue collection efficiency

H₀₃: Cost has no significant effect on revenue collection efficiency

H₀₄: Perceived usefulness has no significant effect on revenue collection efficiency

H₀₅: There is no single independent variable that significantly influences revenue collection efficiency.

1.6. Significance of the Study

The expansion of electricity supply to achieve the long term objective of 100% nationwide electricity supply coverage is a function of the efficiency of Kenya Power revenue collection. First, this study will provide great insight to the management of Kenya Power on how best to implement the adoption of prepaid meters through enhancing customer service, elimination of estimated bills, and disconnection. Secondly, the study will benefit the company on the importance of prepaid systems to enhance public service delivery. Thirdly, scholars and researchers will positively adopt the use of

prepaid meters and also add on existing literature on revenue collection efficiency practice and company policy formulation.

1.7 Limitations of the Study

The major limitation encountered was accessibility to data, and it was addressed by contacting Kenya Power in Nakuru. Problems of respondents' willingness to give information were addressed by ensuring that researcher gives a detailed explanation for the purpose and benefit of the research.

1.8 Scope of the Study

Target population involved all the prepaid meter holders in Nakuru Kenya power limited. Domestic, commercial and industrial users of electricity in Nakuru were considered as respondents.

1.9 Definition of Operational Terms.

Perceived usefulness: refers to the degree to which a person believes that using a particular system would enhance his or her job performance. It also refers to job performance, efficiency and effectiveness, and makes jobs easier. Systems that work faster are likely to attract more customers. Customers are also interested in new technologies that improve their performance as far as financial transaction is concerned (Poon, 2007).

Perceived cost: refers to the details such as transaction costs, subscription fees, time saving and cost of garget (Poon, 2007).

Perceived ease of use: it refers to believe that customer's use of an application will be free of effort (Davis, 2000)

Perceived risk: Perceived risk (PR) is the uncertainty about the outcome of the use of a service. It refers to security and privacy in assessing the user's plan to use a service. (Davis, 2000)

Revenue collection efficiency: describes the amount of money a company generates in a set period of time through the sale of products and/or services
(www.investorglossary.com/2004-2013)

Revenue collection efficiency: refers to an efficient process of a company generating the amount of money from sales. (www.investorglossary.com/2004-2013)

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

In the preceding chapter, the focus of this study has been stated. In this chapter, the present study is put into perspective against related works. To begin with is a review of theoretical literature, followed by reviews on Empirical Literature, and Conceptual Framework.

2.2. Theoretical Literature.

This subsection provides the theoretical approach on the perceived effect of prepaid meters on revenue collection efficiency and the relevant literature from other studies.

2.2.1 The Concept of Revenue collection efficiency

Kabwegyere (2004) argues that revenue collection efficiency determines the level of service delivery. The Total Margin measures the percentage of revenues collected from both primary and peripheral activities that is kept as profit, while the Operating Margin measures the percentage of revenues collected from primary activities that is kept as profit (Montaigne,2010)

The prepaid meter payment system is considered efficient with minimal error based on electricity fixed base tariff price during periodic review. This base price is then adjusted on a monthly basis according to an adjustment formula in order to take into account fluctuations that affect the generation costs of electricity. This includes; for example, increases or decreases in the cost of fuels required for electricity generation. Finally, the

customer is provided with various tariff options that are classified under a tariff structure depending on customer demand levels.

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 (Governance and social development report, 2012).

Some experts argue that billing systems based on consumption are more likely to be paid by individual users (USAID). 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/usage, 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).

In Kenya there has been an increase in new service connections, identification of illegal users, billing of unbilled services, and replacement of faulty meters. As a result, revenue has increased by 83 per cent while the average collection period has fallen from 86 days to 50 days. The use of Integrated Financial Management Systems (IFMS) to identify tax defaulters and manage bad debts in Nyeri and Mavoko in Kenya , was a key factor in improving local tax revenues (IFM, 2009).

2.2.2 Revenue management

Kimes and Wirtz (2003) define revenue management as the application of information systems and pricing strategies to allocate the right capacity to the right customer at the right price at the right time. Revenue management involves making decisions that relate to selling of the right product to the right customers at the right time for the right price. It is different from inventory management and supply chain management because it is concerned with demand-management decisions. Instead of answering the question of “how many product should we order in the face of uncertain demand”, firms use revenue management to explain “how to stimulate demand to use fixed capacity.”

Revenue management is therefore a short-term demand management to promote flexible real-time capacity allocation, customer segmentation, and pricing optimization.

Structurally, revenue management addresses three categories of decisions: structural decisions, price decisions, and quantity decisions (Talluri and van Ryzin 2004b).

According to Raniai (2008), revenue management is an important tool for matching supply and demand by segmenting customers into different segments based on their willingness to pay and allocate limited capacity to the different segments in a way that maximizes company's revenues.

Revenue management is not just about crunching numbers and adjusting points. Rather, it fits as a financial strategy which focuses on price and maximization of revenue. Gabor Forgacs, (2010) expands this thinking by suggesting that revenue management encompasses product definition, competitive benchmarking, strategic pricing, demand forecasting, business mix manipulation, and distribution channel management.

Revenue management deals with the decision of selling the right product to the right customers at the right time for the right price. Different from inventory management and supply chain management, it is concerned with demand-management decisions. Instead of answering the question of "how many product should we order in the face of uncertain demand", firms use revenue management to explain "how to stimulate demand to use fixed capacity. Revenue management is short-term demand management to promote flexible real-time capacity allocation, customer segmentation, and pricing optimization.

2.2.3 Technology Acceptance Model

The Technology Acceptance Model, TAM, was developed by Davis (1989) and postulates that two particular beliefs, Perceived Use and Perceived ease of use, are of primary relevance for computer acceptance behaviors (Davis *et al.*, 1989; Igarria, *et al.*,

1997); Keil, Beranek and Konsynski, 1995). System use is determined by a person's attitude towards the system in the basic TAM model. It consists of external variables which may affect beliefs. This model is derived from the general Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975) in that, TAM is intended to explain computer use. In IT terms this means that the model attempts to explain the attitude towards using IT rather than the attitude towards IT itself. Davis' model specifically postulates that technology use is determined by behavioral intention to use the technology, which is itself determined by both PU and PEOU. Moreover, behavioral intention to use the technology is also directly affected by Perceived use. Behavioral intention to use the technology is then positively associated with the user.

Davis, (1993) posits that the Technology Acceptance Model (TAM) is a theoretical model that explains how users come to accept and use a technology. Prepaid meters assumes perceived usefulness or the degree to which a person believes that using a particular system would enhance their product consumption and perceived ease of use or the degree to which a person believes that using a particular system would be free of the influence of pre-existing external variables e.g. security concerns, convenience, as primary determinants for adoption of a new technology (Lu et al. 2003). Perceived ease of use has a direct effect on perceived usefulness and both determine the consumer's attitude towards use. As a result, this leads to behavioral and actual use of the system. An information systems theory suggests that when users are presented with a new technology, a number of factors influence their decision about how and when they will use it.

User acceptance of technology has been an important field of study for over two decades now. Although many models have been proposed to explain and predict the use of a system, the Technology Acceptance Model has been the only one which has captured the most attention of the Information Systems community. Thus, it is essential for anyone willing to study user acceptance of technology to have an understanding of the Technology Acceptance Model. Current observations indicate that although TAM is a highly cited model, researchers share mixed opinions regarding its theoretical assumptions, and practical effectiveness. It is concluded that research in TAM lacks sufficient rigor and relevance that would make it a well-established theory for the IS community.

2.3. Empirical Literature

2.3.1 Computer Aided Business Process

Business process design and Business Process Re-engineering (BPR) depend crucially on linking production procedures and organizational services to business goals and objectives. Business Process Reengineering (BPR) concerns the fundamental rethinking and radical redesign of a business process to obtain dramatic and sustained improvements in quality, cost, service, lead time, flexibility and innovation. BPR focuses on the whole process starting from product conceptual stage to product design. According to Gunasekaran and Kobu, (2002), BPR provides the opportunity to reengineer the process or to reduce radically the number of activities it takes to carry out a process with the help of advanced Information Technology (IT). New developments in IT such as multimedia, image processing and expert systems, can be used to reduce the number of non-value

added activities. Organizational restructuring including job redesign can be used to improve the delivery of goods and services.

BPR is a structured approach to analyzing and continually improving fundamental activities such as manufacturing, marketing, communications and other major elements of a company's operation. Many organizations have realized how important it is to reduce the product development cycle time with the objective of improving flexibility. Elzinga et al. (1995) claim that the flexibility to adapt to changing market needs and to develop innovative products in such an environment is essential for success.

Successful BPR efforts in many firms have been reported to improve productivity significantly and to reduce staff. However, as the reality of large-scale process change sets in and reengineering failures start coming to the forefront, more careful thought must be given to the change process itself. It is also important that senior leaders in the organization develop a high-level strategic perspective on this multifaceted change phenomenon (Gunasekaran and Kobu, 2002).

2.3.2 The Adoption of Prepaid Meters

The prepaid metering system consists of prepayment meter, IC card, and energy sale management system. Prepaid meter records active energy customers according to their demand and purchase of a certain quantity of energy from the local electric power company. The management system with man-machine interface is easy to collect, analyze and store data. IC card is the medium between prepaid meter and energy sale management system.

Adoption of prepaid meters by Pax Electricity Manual (2007) explains guidelines for new customers. Meter details and customer details are entered into the master terminal located at the regional office. After registration at regional office, a customer has to purchase credit at a sales terminal located at any authorized charging station. The credit value will be stored into the card. After inserting the card into the meter, all information including credit and parameters will be automatically loaded. For every credit transaction, the meter writes status information, available credit, power consumption data, etc. to the smart card. Using the IC card to purchase credit next time, the sales terminal will acquire all information and transfer it to the regional database. The server is the “core” of revenue collection efficiency where all the back-end applications are managed and customers’ information is continuously updated.

2.3.3 The Link between Perceived Risk and Revenue Collection Efficiency

The current tariff is calculated and updated on monthly basis depending on variations of electricity generation costs, including among other things fluctuations in the price of diesel, inflation and staff costs. Under the current post-pay system, the monthly recalculated tariff is applied to each invoice period and then billed to customers for payment. In the case of prepayment meters, however, the case is further complicated by irregular recharge cycles. Given the proposed meter type, the tariff stored in the prepayment meter is updated at the conclusion of charge, at which point the chip card saves the current tariff back to the meter. Given that the prepayment system does not rely on regular billing period intervals, variations of the tariff cannot be applied regularly this system of meter billing though very effective in revenue collection efficiency it presents a

risk of over exploitation of consumer thus presenting risk of customer loss and hence reduced revenue for the company (Utilities Regulatory Authority, 2012).

A study conducted by Naviti (2012) in relation to the accuracy of prepaid meter billing revealed that consumers face unseen risks of paying additional costs. This problem is further complicated if some of the consumption in question falls into tranches, which multiply the additional costs by a factor of 1.21 and 3 respectively. The customer can thus, when recharging and then depleting credit, never rely on knowing whether additional amounts may be owed to the electricity provider. The customer can also not ascertain how much may be owed, if any, until approaching a resale point for a recharge. This makes reasonable budgeting impossible for customers.

2.3.4 The link between Perceived Ease of Use and Revenue Collection Efficiency

Perceived ease of use is concerned with the user's assessment that the system will be easy to use and requires little effort or complexity. In relation to this study customers who chose to adopt prepaid meters presume that the adoption of the new technology will be easy to use and hence require less effort considering the level of literacy of most prepaid meter users from the study area (Kwon and Chidambaram, 2000).

It can also be viewed as the degree to which a person believes that using a particular system will be free of effort. Study conducted by Chau (2002) found out that perceived ease of use influences willingness to use and intention to use a specific technology. In other words it is expected to positively affect perceived usefulness and also behavioral intention to use the technology.

Research findings on prepaid meters agree that in order for prepaid meters to succeed, they must be secure in both reality and consumer perception, convenient, easy to use and be offered at little or no additional cost to the consumer. For example, the mobile payment survey (MP1) found 96% of respondents required confidentiality of data and 92% required little or no costs (Pousttchi and Zenker, 2003).

How customers pay their utility bills may have implications for how they consume energy, as demonstrated by a study of consumption and meter top-up behavior of the households in Northern Ireland that use prepayment meters. Brutscher (2011) shows that consumers with prepaid meters tend to consume more electricity. Households tend to purchase relatively small amounts of top-ups, and adjust to increases in tariffs by increasing their number of top-ups, rather than by increasing the amount. However, exogenous increases in minimum top-up amount result in decreased energy use. This suggests that consumers perceive costs differently according to how large they are. They have different mental accounts for larger purchases, and are more aware of the consumption after they have made a large top-up. Increasing minimum top-up amount would therefore likely result in decreased energy consumption.

2.3.5 The Link between Perceived Cost and Revenue Collection Efficiency

Reliable and cost effective electricity service is critical to economic growth. In order for power supply companies to satisfy the electricity demands of its current customers and bring its services to the new customers, it is essential to ensure an adequate revenue stream to cover its operations and maintenance costs and a portion for new investments in system rehabilitation and expansion.

Casarin and Nicollier (2008) summarize the results of a survey conducted among local electricity users. Results indicate that prepaid meters lead to improved welfare. They also indicate that advantages of the system are linked to the reduction of arrears in accounts receivables, operational and financial costs on the part of the service provider and better allocation of resources for the user. Consumer evidence, however suggests that the main arguments against prepayments relate to the possibility of self-disconnection by low income consumers.

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 (Gómez-Lobo and Contreras, 2004). In general, experiences with policies that adopt alternative payment methods for utilities have been scarce. The simplest alternative, which is often suggested, consists of increasing the frequency of billing to low income users. Estache *et al.* (2000) claim that a disadvantage of this mechanism is that it would increase administrative collection costs, which would ultimately result in higher tariffs.

Using prepaid service is one option available to consumers that want to better manage their consumption and optimize their budget allocation. These services are well-known within the insurance and the telecommunication markets. They allow consumers to control their budget and obtain full transparency of consumption; consumers will not receive an unpleasant surprise when they receive monthly invoices. But this concept is not only restricted to the financial services or to mobile telecom services, it is also a viable commercial and marketing concept for the utilities market. 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 and 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 Shah, 2003). However, these apparent improvements are not cost free. Not only does the change from conventional to prepaid electricity imply a change in consumption habits which may reduce the utility of consumers, but it may also result in too few electricity consumption or in the self-disconnection of poorer groups of consumers.

2.3.6 Link between Perceived Usefulness and Revenue Collection Efficiency

According to this study, Perceived use is defined as the user's subjective probability that using a specific technology will increase his or her job performance within an organizational setting. This theory argues that the user of a prepaid electric meter will be subjective to the increased efficiency and attained satisfaction from the use of the meters. There will also be efficient revenue collection efficiency as a result of adopting prepaid meters (Davis et al., 1989).

Davis, Bagozzi and Warshaw (1989), and Thompson and Rose (1994), argue that usage is a necessary condition for ensuring productivity payoffs from Information system

investment. Lu and Gustafson (1994) argue that people use information technology because they believe that computers will increase their problem solving performance (usefulness) and they are relatively effort free to use (ease of use). Lu and Gustafson (*ibid*) suggest that the belief variable, perceived use is the most important factor determining usage of any form of information technology aimed at providing quality service in a business environment. It also ensures efficiency in profitability, Technology Developers and inventors of prepayment systems need more understanding of how users perceive and react to elements of new technology along with how to most effectively apply it in enhancing service delivery and customer satisfaction (Koohangand Durante, 2003). Grandon, Alshare, and Kwan, (2005) argue that knowing users' intentions and understanding the factors that influence consumers' beliefs about prepaid metering system can help system administrators and managers to create mechanisms for attracting more customers to adopt this new technology. It is therefore necessary to conduct research that deals more intensively with users' perception, attitude towards, and intention to use prepaid meters. Little research has been done in Korea to empirically determine the relationship of consumers and prepayment metering methodology use with personal factors such as perceived usefulness, attitude, intention to use, and self-efficacy, with social factors such as subjective norms and organizational factors such as system accessibility.

2.4 Conceptual Framework

Electricity supply and its revenue have come of age since the privatization of Kenya power limited. This study is aimed at establishing the effect of prepaid meters on revenue collection efficiency. The conceptual frame work explains the effect of perceived risk,

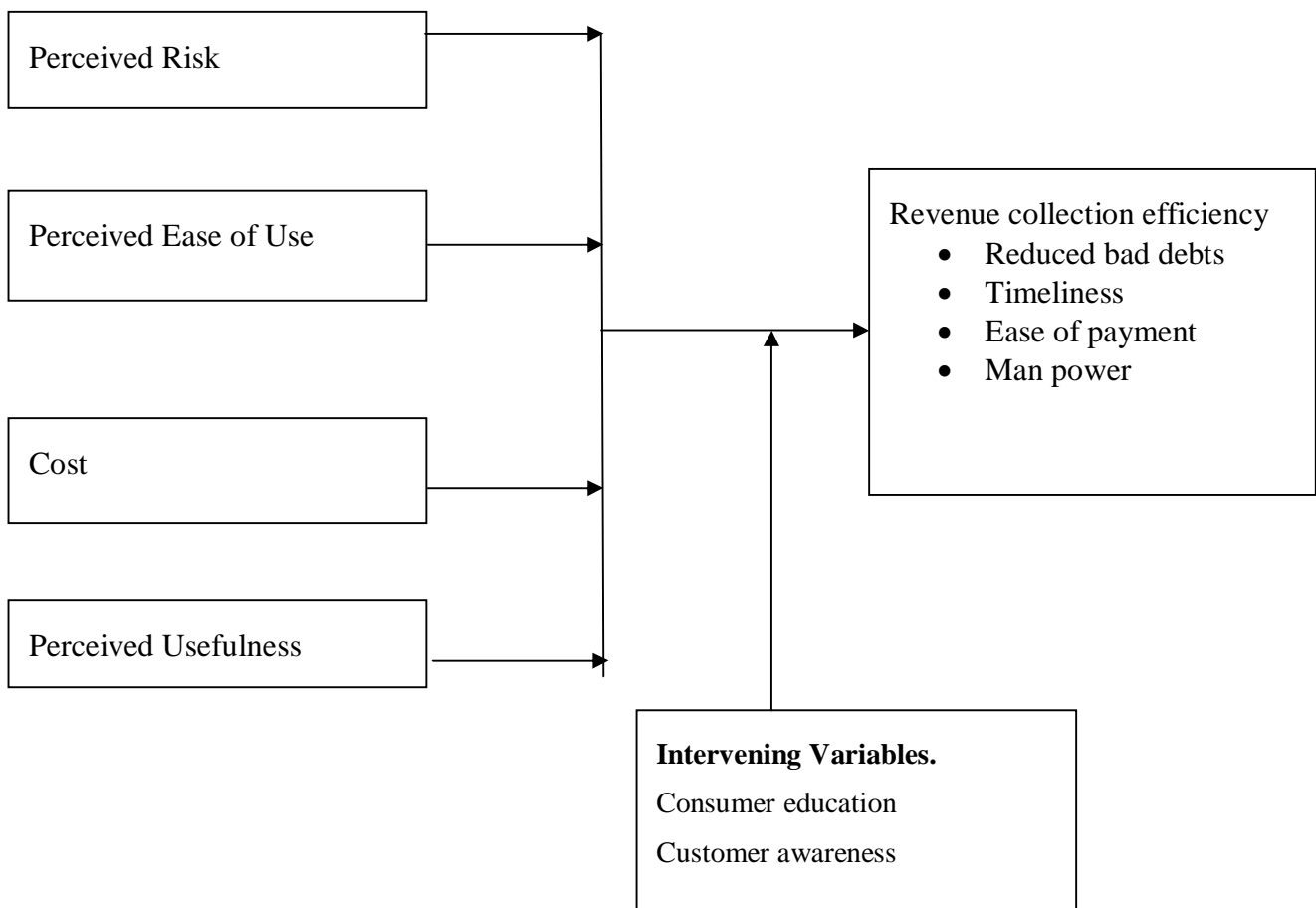
perceived ease of use and cost (independent variable) and revenue collection efficiency (dependent variable). The conceptual model shows the relationship of the three study variables prepaid meters and measures of revenue collection efficiency as illustrated in figure 2.1

Conceptual framework

Independent variables

Dependent variable

Perceived Effects



Source, Author (2013)

Figure 2.1 Conceptual Framework based on TAM on relationship between perceived effect of pre-paid meters and revenue collection efficiency

2.5 Research Gap.

From the aforementioned literature review, no study has clearly indicated how prepaid meters can affect revenue collection efficiency. Kabwegyere (2004) examined the concept of revenue collection efficiency but not effect on revenue collection efficiency. Naviti (2012) studied the accuracy of prepaid meter billing which examines other costs involved in prepaid billing.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

In the preceding chapter, literature related to this study has been reviewed and theoretical framework discussed. The present chapter describes the research design and gives the sources of the study data as well as sampling procedures, data collection methods, the method that was used to analyze data and finally how validity and reliability of the instruments were tested.

3.2 Research Design

The researcher used survey research design. The survey method provides a quantitative description of attitudes, experiences and opinions of the sample population (Creswell 2003). Survey research design relies on primary data. Further, the design is used to show the cause- effect relationship. This study brought out adequate research arguments on the effect of prepaid meters and revenue collection efficiency in Nakuru Kenya Power.

3.3 Target Population and Sample

The study targeted prepaid electricity meter users in Nakuru. The research targeted a population of 396 domestic, corporate and also industrial users of prepaid electricity meters in Nakuru, Kenya (KPLC data Base, 2012). The target population was considered appropriate for providing a focal point for the study as regards the impact of prepaid meters on revenue collection efficiency.

3.4 Sampling Procure and Sample Size

The study used stratified sampling procedure with proportional allocation to categorize prepaid meter user into three sectors (strata), namely commercial, domestic and industrial users. The method was used due to the assortment nature of prepaid electricity users. The study used Yamane (1967:886) simplified formula to calculate sample sizes. Proportional method was used to distribute the sample size among the stratus so as to maximize survey precision given a fixed sample size. With proportional allocation, the "best" sample size for stratum h would be:

$$n_h = \left(\frac{n}{N}\right) N_h \text{ Where,}$$

n_h = size for stratum h,

N_h = size for stratum h,

N = total population

Table 3.1 Sample size

Population Category	Target Population	Sample Size $n_h = \left(\frac{n}{N}\right) N_h$
Domestic users	215	108
Commercial users	145	73
Industrial user	36	18
Total	396	199

Source, Author (2013)

3.5 Data collection Instruments

Self-administered questionnaires were used to collect data. Questionnaires are an efficient way of gathering data using a standard set of questions. In order to increase the response rate, two research assistants were used to clarify any arising issues during the filling of questionnaires by the respondents.

3.5.1 Measuring Independent Variables

This construct was measured from respondents' questionnaires where they were asked to indicate the extent of agreement or disagreement with six statements each concerning the perceived technologies. How they perceived the use of prepaid meters, the risk of the technology and cost implications of adopting the technology. Response was anchored with Likert- scale Independent variables (Perceived risk, perceived ease of use, cost and perceived usefulness) based on multiple-item constructs, and was measured through Likert- scale with a scale of 1-strongly Disagree, 2- Disagree, 3-Neutral, 4- Agree and 5-strongly agreed capturing all the desired items of the research variables.

3.5.2 Measure of Dependent Variable

The dependent variable (Revenue collection efficiency) was measured by revenue collection efficiency by method of payment and payment time by the prepaid meter users.

3.6 Validity and Reliability of the Instruments

According to Panton (2000), validity is the quality attributed to proposition or measures of the degree to which they conform to establish the truth. For this study, validity is achieved through a pilot test. The research employed the use of questionnaires.

The purpose of construct validity is to show that the items measure and are correlated with what they purport to measure, and that the items do not correlate with other constructs. Cronbach's alpha was used to determine reliability, where Cronbach's coefficient, having a value of more than 0.7 was considered adequate (Nunally, 1978).

3.7 Data Analysis and Presentation

Data collected was analyzed by use of both descriptive and inferential statistics.

Descriptive statistics used included mean, mode and median while, inferential statistics comprised of correlation and regression analysis. Correlation analyses were used to measure the degree of relationship between the two variables. Kothari (2004) says the coefficients assume that there is linear relationship between the two variables and that the two variables are casually related which means that one of the variables is independent and the other is dependent.

Correlation analysis was used to test hypotheses 1, 2, 3 and 4 while Regression analysis was used to test hypothesis 5.

The multiple regression model that was used in this study is given as:

$$Y = \alpha + \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where,

y =Revenue collection efficiency.

α = constant.

$\beta_1 \dots \beta_4$ = the slope which represents the degree in which firm performance changes as the independent variable change by one unit variables.

x_1 = Perceived risk

x_2 = Perceived ease of use

x_3 = perceived Cost

x_4 = Perceived usefulness

ε = error term

All tests were two-tailed. Significant levels was measured at 95% confidence level with significant differences recorded at $p < 0.05$

3.8 Ethical considerations

Ethical considerations are the principles that a researcher should abide by when conducting a research. Every organization has rules governing their policy and practice that may require prior permission before undertaking research. This research is purely academic and the university has given authority for the researcher to carry out the research. However, the researcher must seek permission from the management of the company to carry out this research.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS.

4.1 Introduction

In this chapter, data was analyzed and discussed accordingly in relation to the objectives of the study. First, the demographic profile of respondents was analyzed and presented using frequency tables and percentages, followed by descriptive statistics such as: Mean, mode and standard deviations. Inferential statistics such as Pearson correlation and Multiple Regression models were computed.

4.2 Descriptive Statistics.

4.2.1 Demographic Information

Demographic information is crucial in the identification of demographic related characteristics such as gender, age bracket and marital status of the respondents as well as level of education and training attained. The results regarding the demographic information is summarized and presented in Table 4.1.

The findings in Table 4.1 revealed that majority 114(65.1%) of the respondents were males, while 61(34.9%) were females; thus, there was fairly equal distribution of Gender among the respondents. Further, the results indicates that 29 (16.6%) of the respondents were aged between 24-29 years, 57 (32.6%) of the respondents were between 30-35 years, 28 (16%) of the respondents were between 36-41 years and 61 (34.9%) of the respondents were between 42-47 years.

It was also found out that 75 or 42.9% of the respondents had attained secondary level of education. In relation to average monthly consumption, most respondents, 51 (29.1%)

had an average monthly consumption of between 1001-5000; 46 (26.3%) between 10,000-15,000; 39 (22.3%) between 501-1000; 29 (16.6%) 500 and below, whereas 10 (5.7%) had an average monthly consumption of between 5,001-10,000.

Finally, findings on the duration of using the prepaid meter showed that 11 (6.3%) of the respondents had a duration of less than a year, majority 154 (88%) one to two years, whereas 10 (5.7%) had a duration of 3-4 years.

4.2.2 Perceived Usefulness

The study sought to establish the respondents' view on perceived usefulness of using the prepaid meter (see Table 4.2). The results showed that using prepaid meter would improve management of daily power consumption as indicated by 63 (36%) of the respondents. This was supported by a mode of 4. The respondents (72.5, 41.5%) generally agreed with a mode of 4. They agreed that using prepaid meters enabled them to regulate electricity consumption. In addition, using prepaid meters would enhance knowledge on consumption rates (73.5, 42%). This was supported by a mode of 4. There was a divergent view over prepaid meters and peace of mind with the study findings showing that only 43 (24.6%) of the respondents had peace of mind. This was supported by a mode of 3. In general, perceived usefulness of prepaid meter summed up to mode of 4.

Table 4.1 Demographic Information

		Frequency	Percent
Gender	Male	114	65.1
	Female	61	34.9
	Total	175	100
Age Bracket	24-29	29	16.6
	30-35	57	32.6
	36-41	28	16
	42-47	61	34.9
	Total	175	100
Highest Level of Education Attained	Secondary	75	42.9
	Tertiary	100	57.1
	Total	175	100
Average Monthly Consumption	500 and below	29	16.6
	501-1000	39	22.3
	1001 – 5000	51	29.1
	5001 and 10000	10	5.7
	10000-15000	46	26.3
	Total	175	100
Duration Using Prepaid Meter	Less than 1 yrs	11	6.3
	One - 2yrs	154	88
	3-4yrs	10	5.7
	Total	175	100

Table 4.2 Perceived Usefulness

		GD	N	GA	Mode
Using prepaid meter would improve management of my daily power consumption	Frequency	8.5	32	63	4
	Percent	4.85	18.3	36	
Using prepaid meters enable me to regulate my electricity consumption.	Frequency	15	0	72.5	4
	Percent	8.55	0	41.45	
Using prepaid meter would enhance knowledge on consumption rates	Frequency	11	17	73.5	4
	Percent	6.3	9.7	42	
Using prepaid meter gives me peace of mind	Frequency	24.5	40	43	3
	Percent	14	22.9	24.6	
Perceived usefulness					4

GD- Generally Disagree

GA- Generally Agree

N- neutral

4.2.3 Perceived Ease of Use

The study findings on the perceived ease of use of prepaid meters are presented in Table 4.3. It was evident from the findings that prepaid meters are used by most of the respondent as shown by 74.5 (42.55%) of the respondents. In addition, respondents reported easy to use as long as they have instructions and this was supported by a mode of 4. In addition 52.5 (30%) of the respondents revealed that they were not sure if prepaid meters was easy to use even without anyone to demonstrate how to use it. This view was supported by a mode of 3. Further, the findings of the study indicated that majority 119 (68%) of the respondents revealed that prepaid meters were easy to use even without having never used the system before. This was confirmed by a mode of 3.

Finally, 67.5 (38.6%) of the respondents stated that prepaid meters were easy to use as long as they had seen someone else using it. The study findings on the perceived ease of use of prepaid meters totaled to mode 4.

Table 4.3 Perceived Ease of Use

Prepaid meters is easy to use		GD	N	GA	Mode
As long as I have instructions	Frequency	26		74.5	4
	Percent	14.9		42.55	
Even if there is no one around to show me how to do it	Frequency	29.5	11	52.5	4
	Percent	16.85	6.3	30	
Even if I have never used such a system before	Frequency	19.5	17	119	3
	Percent	11.15	9.7	68	
As long as I have seen someone else using it before trying it myself	Frequency	29	11	67.5	4
	Percent	16.6	6.3	38.6	
Perceived ease of use					4
GD- Generally Disagree		GA- Generally Agree		N- neutral	

4.2.4 Perceived Risk

The study results on the perceived risk of using prepaid meters are presented in Table 4.4. The findings revealed that 79 (45.15%) of the respondents were confident over the security aspect of prepaid meter and this was confirmed by a mode of 3. Also, 69 (39.4%) of the respondents expressed fear that information concerning their transactions will be known by others as confirmed by a mode of 2. In addition, 18 (10.3%) of the respondents feel that information concerning their transactions might be tampered with as shown by a

mode of 2. Finally, 21.5 (12.3%) of the respondents are not sure that they would be compensated as a result of loss as confirmed by a mode of 3. In general, perceived risk of use of prepaid meter summed up to a mode of 3.

Table 4.4 Perceived Risk

		GD	n	GA	Mode
I am confident over the security aspects of prepaid meter	Frequency	8.5		79	3
	Percent	4.85		45.15	
I am afraid that information concerning my transactions will be known to others	Frequency	48	10	69	2
	Percent	27.45	5.7	39.4	
Information concerning my transactions might be tempered by others	Frequency	64	11	18	2
	Percent	36.6	6.3	10.3	
I am confident that I will be compensated as a result of loss	Frequency	18	96	21.5	3
	Percent	10.3	54.9	12.3	
Perceived risk					4

GD- Generally Disagree GA- Generally Agree N- neutral

4.2.5 Perceived Cost

The study sought to establish the perceived cost of prepaid meter. Study findings in Table 4.5 revealed that 66 (37.75%) of the respondents agreed that the transaction charge for prepaid is affordable and this was confirmed by a mode of 4. The majority of the respondents 118 (67.4%) agreed that the cost of travelling to the nearest Kenya Power office is low and this was supported by a mode of 4. In addition, the cost of owning is low as supported by 79 (45.1%) of the respondents and this was confirmed by a mode of 4. Finally, 73.5 (42%) of the respondents agreed that prepaid meter had no hidden

charges and this was affirmed by a mode of 4. In general, the perceived cost of prepaid meter summed up to a mode of 4.

Table 4.5 Perceived Cost

		GD	N	GA	Mode
The transaction charge for prepaid is affordable	Frequency	21.5	0	66	4
	Percent	12.3	0	37.75	
The cost of travelling to the nearest KP office is low	Frequency	28.5		118	4
	Percent	16.3		67.4	
The cost of owning a prepaid is low	Frequency	0	17	79	4
	Percent	0	9.7	45.1	
Prepaid meters has no hidden charges	Frequency	9	10	73.5	4
	Percent	5.15	5.7	42	
Perceived cost					4

GD- Generally Disagree GA- Generally Agree N- neutral

4.2.6 Revenue Collection Efficiency

The study established revenue collection efficiency (see Table 4.6). From the findings, it was revealed that majority 130 (74.3%) of the respondents, agreed that the prepaid meter had been functioning properly without interruption (timeless) and this was confirmed by a mode of 4. 116 (66.3%) were able to determine consumption rate and paying them in time (bad debts) as affirmed by a mode of 4. In addition, majority 148 (84.5%) of respondents paid bills prior to consumption (bad debts) as affirmed by a mode of 4. The findings also showed that majority 148 (84.5%) of the respondents no longer had to interact with Kenya Power employees for payment of bills (man power) as affirmed by a mode of 4. Finally, a majority 164 (93.7%) of the respondents had never been late in

paying electricity bills (timeless/bad debts) as supported by a mode of 4. In general, revenue collection efficiency summed up to a mode of 4.

Table 4.6 Revenue Collection Efficiency

		GD	N	GA	Mode
My prepaid meter has been functioning properly without any interruption (timeless)	Frequency	45	0	130	4
	Percent	25.7	0	74.3	
Am able to determine my consumption rate and pay them in time (bad debts)	Frequency	49	10	116	4
	Percent	28	5.7	66.3	
I pay my bills prior to consumption	Frequency	10	17	148	4
	Percent	5.7	9.7	84.5	
I no longer have to interact with Kenya Power employees on payment of my bills.	Frequency	10	17	148	4
	Percent	5.7	9.7	84.5	
I have never been late in paying my electricity bills (timeliness/bad debts)	Frequency	11	0	164	4
	Percent	6.3	0	93.7	
Revenue cost					4

4.3 Inferential Statistics.

4.3.1 Correlation Statistics

Correlation statistics is a method of assessing the relationship between variables, in this case, factors affecting revenue collection efficiency. Specifically, it measures the extent of correspondence between the ordering of two random variables; although, a significant correlation does not necessarily indicate causality but rather a common linkage in a sequence of events. Thus, the study analyzed the relationships that are inherent among

the independent and dependent variables as well as inter-independent factor correlations. The results of this analysis are presented in Table 4.7.

The results indicated that perceived usefulness was positively correlated to revenue collection efficiency ($r=0.385$). Perceived ease of use was highly positively associated with revenue collection efficiency ($r = .560$). However, perceived risk showed a negative relationship with revenue collection efficiency ($r = -0.394$). In addition, perceived low cost showed the highest positive significant relationship with revenue collection efficiency ($r = 0.810$). From the findings it showed that all the four variables (perceived usefulness, perceived ease of use, perceived risk and perceived low cost) were positively related to revenue collection efficiency apart from perceived risk which was negatively correlated.

4.3.2 Regression Results

A regression analysis of the findings revealed that 77.5 percent variation of revenue collection efficiency is explained by perceived cost, perceived ease of use, perceived risk and perceived usefulness as supported by $R^2 = 0.775$ and adjusted $R^2 = 0.77$.

Table 4.7 Correlation Statistics

	Revenue collection efficiency	Perceived usefulness	Perceived ease of use	Perceived risk	Perceived low cost
revenue collection efficiency	1				
Perceived usefulness	.385**	1			
Perceived ease of use	.560**	0.077	1		
Perceived risk	-.394**	-.450**	-.309**	1	
Perceived low cost	.810**	.607**	.321**	-.555**	1

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

Table 4.8 Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.880a	0.775	0.77	0.33305

a Predictors: (Constant), perceived cost, perceived ease of use, perceived risk, perceived usefulness

b Dependent Variable: revenue collection efficiency

4.4 ANOVA Results

ANOVA results showed an overall significance of the model (see Table 4.9). The study findings recorded an F value of 146.433, with a p value = 0.000 significant at 0.05. This

implies that the joint prediction of aforementioned independent variables of revenue collection was significant. This shows that the model can be used to predict revenue collection using perceived cost, perceived ease of use, perceived risk, and perceived usefulness.

Table 4.9 ANOVA Model

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	64.973	4	16.243	146.433	.000b
Residual	18.857	170	0.111		
Total	83.83	174			

a Dependent Variable: revenue collection

b Predictors: (Constant), perceived cost, perceived ease of use, perceived risk, perceived usefulness

4.4 Hypotheses Testing

Hypothesis 1 (H_{o1}) stated that there is no effect between perceived risk and revenue collection efficiency. The findings showed that perceived risk had coefficients of estimate (β_1) = -0.182 which was significant on basis of p value = 0.005 and t value = -1.733, thus hypothesis 1 was rejected. Hence, perceived risk negatively affected revenue collection efficiency.

Hypothesis 2 (H_{o2}) stipulated that there is no effect between perceived ease of use and revenue collection efficiency. The findings showed that $\beta_2 = 0.342$ and p value = 0.004. In additional, t test value for perceived ease of use was 8.621, hence, hypothesis 2 was rejected. Thus, perceived ease of use had positive effect on revenue collection efficiency.

Hypothesis 3 (H_{03}) hypothesized that there is no effect between perceived cost and revenue collection efficiency. Hypothesis 3 was rejected on the basis that $\beta_4 = 0.823$ was significant at p value = 0.000. In addition, t ratio = 15.949 provided more evidence that perceived cost significantly affects revenue collection efficiency. This implies increasing perceived cost would increase revenue collection efficiency.

Hypothesis 4 (H_{04}) stated that there is no effect between perceived usefulness and revenue collection efficiency. However, the hypothesis was rejected. Study findings in Table 4.10 indicated that $\beta_1 = 0.131$ was significant at p value $0.000 < 0.05$. Thus, perceived usefulness positively influenced revenue collection efficiency, providing grounds for rejection of hypothesis 4 this infers that increasing perceived usefulness will lead to a significant increase in revenue collection efficiency.

The rule of thumb was applied in the interpretation of the variance inflation factor (VIF). From Table 4.10, the VIF for all the estimated parameters was found to be less than 5 which indicate that multi collinearity is minimal among the independent factors. This implies that the variation contributed by each of the independent factors was significant independently and all the factors should be included in the prediction model.

Table 4.10 Coefficients of Estimates

	Unstandardized Coefficients		Standardized Coefficients		Collinearity Statistics		
	B	Std. Error	Beta	T	Sig.	Tolerance	VIF
(Constant)	-1.771	0.411		-4.310	0.000		
Perceived usefulness	0.137	0.047	0.131	2.900	0.004	0.646	1.548
Perceived ease of use	0.683	0.079	0.342	8.621	0.000	0.84	1.19
Perceived risk	-0.077	0.044	-0.182	-1.733	0.005	0.59	1.694
Perceived cost	0.837	0.052	0.823	15.949	0.000	0.497	2.013

a Dependent Variable: revenue collection efficiency

CHAPTER FIVE

SUMMARY OF FINDINGS, DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the findings, the discussion and the conclusion as well as the recommendations based on the findings of the study. The main purpose of the study was to investigate the effects of prepaid meters on revenue collection efficiency in Kenya Power Limited, Nakuru. The study also made inference on the hypothesis that perceived risk, perceived ease of use, cost and perceived usefulness has no effect on revenue collection efficiency.

5.2 Summary of Findings

5.2.1 Perceived Risk and Revenue Collection Efficiency

According to hypothesis statement, perceived risk has no significant effect on revenue collection efficiency (H_{01}). The findings show inconsistency with the hypothesis since perceived risk recorded a beta coefficient (β) of (-0.182, $\rho=0.085<0.05$), hence, perceived risk was negatively correlated to revenue collection efficiency. Usually, the current tariff is calculated on a monthly basis depending on variations of electricity generation costs, fluctuations in the price of diesel, inflation and staff costs for post payment customers. However, for prepayment meters the case is complicated because of irregular recharge cycles. This is because it does not rely on regular billing period intervals, thus, the variations of the tariff cannot be applied regularly. Hence, it presents a risk of over exploitation of consumer leading to customer loss and this contributes to reduced revenue

for the company (Utilities Regulatory Authority, 2012). There is evidence that customers using the prepaid bill face unforeseen risk of paying additional cost as a result of the accuracy of the prepaid meter billing. In certain instances, the consumption in question falls into tranches, which multiply the additional costs by a factor of 1.21 and 3 respectively; therefore, putting the consumer at a great risk as affirmed in a study conducted by Naviti (2012).

5.2.2 Perceived Ease of Use

In relation to hypothesis statement, perceived ease of use has no significant effect on revenue collection efficiency (H_{02}). The findings reveal inconsistency with the hypothesis since perceived ease of use recorded a beta coefficient (β) of (0.342, $\rho=0.004<0.05$). This means that perceived ease of use was positively correlated to revenue collection efficiency. The research findings therefore support the argument by Kwon and Chidambaram, (2000) that consumers that choose to adopt prepaid meters, thought it would be easier for them to use. Little effort would be required considering their level of literacy; hence, there would be effective revenue collection efficiency.

From the study findings, it was revealed that prepaid meters are easy to use as evidenced by 42.55% of the respondents. Thus, how customers pay their utility bills may have implications on how they consume energy. Brutscher, (2011) asserted that consumers with prepaid meters tend to consume more electricity. Therefore, households tend to purchase relatively small amounts of top-ups, and adjust to increases in tariffs by increasing their number of top-ups, rather than by increasing the amount and in the long run revenue collection efficiency is enhanced.

5.2.3 Cost and Revenue Collection Efficiency

According to hypothesis statement, cost has no significant effect on revenue collection (H_{O3}). The findings show inconsistency with the hypothesis since cost recorded a beta coefficient (β) of (0.823, $\rho=0.000<0.05$). Cost was positively correlated to revenue collection efficiency. Prior payment to consumption implied both a significant improvement in the collection of revenues and a reduction of working capital. It is therefore essential for power companies to ensure an adequate revenue stream to cover its operations and maintenance costs and a portion for new investments in system rehabilitation and expansion. Results from a survey conducted by Casarin and Nicollier (2008) revealed 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. They would be fully aware of the amount to be paid once monthly invoices are received; hence, enhancing revenue collection efficiency.

5.2.4 Perceived Usefulness and Received Collection

Hypothesis (H_{O4}) stated that perceived usefulness has no significant effect on revenue allocation. The research findings show inconsistency with the hypothesis since perceived usefulness recorded a beta coefficient (β) of (0.131, $\rho=0.000<0.05$), hence, perceived usefulness was positively correlated to revenue collection efficiency.

The research findings therefore support the argument by (Davis et al., 1989) that using a specific technology will increase job performance within an organizational setting. Use of prepaid electric meter enhances efficiency and attains satisfaction among the users,

hence, resulting to efficient revenue collection efficiency. The findings also concur with Lu and Gustafson (1994) that perceived use is significant in determining the usage of any form of information technology leading to provision of quality service and ensuring efficiency in profitability thus enhancing revenue collection efficiency.

5.3 Conclusion

The study affirms that perceived risk has a significant effect on revenue collection efficiency. There is evidence that the use of prepaid bill by customers is associated with unforeseen risk of paying extra cost as a result of lack of accuracy of the meter billing thus posing as a risk to customers.

The study also provides some precursory evidence that perceived ease of use seem to play an important role in improving revenue collection efficiency. Specifically, consumers who choose to adopt prepaid meters, it would be easier for them to use. Less effort will be required thus increasing revenue collection efficiency.

The study affirms that cost has a significant effect on revenue collection efficiency. From the study findings, there is enough support that prior payment of prepaid meter enhances revenue collection efficiency. It is noted that purchase of relatively small amounts of top-ups will in turn enhance revenue collection efficiency.

Finally the study concludes that perceived usefulness has a significant effect on revenue collection efficiency. It is therefore prudent to enhance efficiency and attain satisfaction among the customers using prepaid meter as this will in turn contribute to revenue collection efficiency.

5.4 Recommendations

Based on the study findings that perceived risk has a significant effect on revenue collection efficiency, the Kenya Power company should enhance confidence over the security aspect of customers so that they do not suffer from any losses. Confidentiality should also be enhanced so that information of customers is not known to others and their information is not tampered with and in case of loss, customers should be compensated. There is also evidence that perceived ease of use has a significant effect on revenue collection efficiency. Therefore, there should be clear guidelines and instructions for the use of prepaid meter. The customer care service should enhance their service delivery to customers so that they have the required knowledge on the use of prepaid meter. The study results also suggest that cost has a significant effect on revenue collection efficiency. Therefore, charges for prepaid meter should be affordable to customers so that they are not discouraged from using the prepaid meter.

Finally, perceived usefulness has a significant effect on revenue collection efficiency. The use of prepaid meter should be increased since using pre-paid meter improves management of daily power consumption of customers, saving time and regulation of electricity consumption.

Kenya power should strive to install prepaid meter to all customer and enhance customer education. This is because from the study, prepaid meters would help Kenya power in effective management of its revenue collection.

5.5 Suggestions for Further Studies

The study investigated the effects of prepaid meters on revenue collection efficiency in Kenya Power, Nakuru. The limitation of this study is that only Kenya Power, Nakuru was included in the sample. Thus, for future research, the researcher should try to include other branches from other parts of the country and extend this research by investigating the actual impact of prepaid meters on consumption of power. Further, the study should also put into consideration the effect of power outages on consumption rate of prepaid meters.

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APPENDIX: QUESTIONNAIRE

EFFECT OF PREPAID METERS ON REVENUE COLLECTION EFFICIENCY:

A CASE OF NAKURU KENYA POWER LIMITED, KENYA

Dear Respondent,

I am an MBA student at Kabarak University business school and I am conducting a study on **effect of prepaid meters on revenue collection efficiency**. The objective of this research project is to attempt to understand how pre-paid meter has enhanced efficiency on revenue collection. This research is for academic purpose only. I request you to take a few minutes to fill this questionnaire. Information that will be provided through filling of this questionnaire is considered of great value to this study and will be treated with confidentiality. If you have any questions or concerns about completing the questionnaire or about participating in this study, you may contact me on 0720775665 or atjnkiko@gmail.com. This study has been approved by the Kabarak University School of Business.

SECTION A

BACKGROUND INFORMATION

1. Gender

- Male
- Female

2. Kindly indicate your age bracket

- 18-23 years
- 24-29 years
- 30-35years
- 36-41years
-

- 42-47years
- 48-53years
- 54-59years
- 60 and above

3. Kindly indicate the highest level of education attained.

- Informal education
- Primary
- Secondary
- tertiary

4. Kindly indicate your average monthly Consumption (In ksh)

- 500 and below
- 501-1000
- 1001-5000
- 5001-10,000
- 10,001- 15,000
- 15,001 and above

5. Kindly indicate the duration for which you have used prepaid meters

- Less than 1 year
- One – 2 years
- Three – 4 years
- Over 5 years

Section B

Q3. On a scale of 1-5, express your opinion in usefulness where; 1.SDA= strongly disagree, 2.DA= Disagree, 3.N=Neutral, 4. A = Agree while 5.SA = Strongly Agree.

Please tick (√) in the most appropriate box.

Perceived usefulness

	Opinion	SDA	DA	N	A	SA
1	Using pre-paid meter would improve management of my daily power consumption					
2	Using prepaid meter enables me to regulate my electricity consumption					
3	Using prepaid meter would enhance knowledge on consumption rates					
4	Using prepaid meter saves my time					
5	Using prepaid meter gives me peace of mind					

Perceived ease of use

	OPINION	SDA	DA	N	A	SA
1	Prepaid meters is easy to use as long as I have instructions for reference					
2	Pre-paid meter is easy to use even if there is no one around to show me how to do it.					
3	Pre-paid meter is easy to use even if I have never used such a system before.					
4	Pre-paid meter is easy to use as long as I have seen someone else using it before trying it myself.					

Perceived risk

	OPINION	SDA	DA	N	A	SA
1	I am confident over the security aspects of prepaid meter.					
2	I am afraid that information concerning my transactions will be known to others.					
3	Information concerning my transactions might be tampered by others					
4	I am confident that I will be compensated as a result of loss.					

Perceived cost

	OPINION	SDA	DA	N	A	SA
1	The transaction charge for pre paid is affordable					
2	The cost of travelling to the nearest KP offices low.					
3	The cost of owning a pre paid is low.					
4	Pre paid meters has no hidden charges.					

Revenue collection efficiency

	OPINION	SDA	DA	N	A	SA
1	My prepaid meter has been functioning properly without any interruptions.(timeliness)					
2	Am able to determine my consumption rate and pay them in time(bad debts)					
3	I pay my bills prior to consumption (Bad debts)					

4	I no longer have to interact with Kenya Power employees on payment of my bills.(man power)					
5	I have never been late in paying my electricity bills (timeliness/ bad debts)					