

**EFFECTS OF MOBILE BANKING ON THE EFFICIENCY OF MICRO AND SMALL
ENTERPRISES IN GIKOMBA MARKET NAIROBI COUNTY**

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**A THESIS SUBMITTED TO THE SCHOOL OF BUSINESS MANAGEMENT AND
ECONOMICS IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE
AWARD OF THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION OF
DEDAN KIMATHI UNIVERSITY OF TECHNOLOGY**

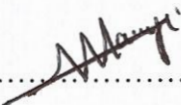
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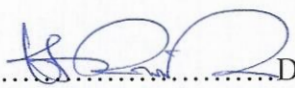
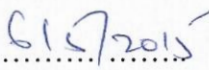
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DEDICATION

This thesis is dedicated to baby Yusuf.

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To my heavenly father for taking me through this academic journey successfully and giving me strength, endurance, patience and wisdom during this research period. To my husband and the entire family for their support and understanding, thank you for always being there for me and for being my reason to want to excel even more. I extend my special thanks to my employer for giving me the opportunity to pursue my academic dream.

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ABSTRACT

The study sought to investigate the adoption of mobile banking by MSEs in the Gikomba market with the objective of assessing the extent to which the use of mobile banking enhances the efficiency of MSEs in the market. Gikomba market was selected as the study area due to its diversity. The study adopted a descriptive research design in its methodology. The study was guided by the following objectives: to examine the effect of procurement efficiency on the operational efficiency of MSEs at Gikomba market, to investigate the influence of improved service on the operational efficiency of MSEs at Gikomba market, to assess the effect of paperless transactions on the operational efficiency of MSEs at Gikomba market, and to examine the effect of risk management on operational efficiency among MSEs at Gikomba market. The population of interest included all the MSEs in the market. Three theories constituted the theoretical framework of the study including: the theory of Bank – Focused model, The Bank – Led Model and the Non-bank – Led Model. The market was segmented into three zones including; Kariokor, Gikomba-KomboMunyiri Road, and Shauri- MoyoMetal-works and Jua Kali market. The sampling frame of two hundred and eight licensed MSEs was drawn from the Nairobi City Council license register of 2011 from which a thirty percent sample was selected for the study. Questionnaires were used to collect primary data from the respondents. The data was quantitatively and qualitatively analyzed and presented in frequency and percentage tables. The study reveals that most of the MSEs in Gikomba market have adopted mobile banking. The outcome of the study reveals a positive correlation between the operations efficiency of the MSEs and the mobile banking practices they have adopted for the last five years. Procurement efficiency, improved service delivery, paperless transactions, and risk management are the key mobile banking practices that have significantly affected the operations efficiency of the MSEs at Gikomba market as supported by the outcome of the regression analysis indicating a high Coefficient of Multiple Determination. The study makes significant contribution across the area of MSEs adoption of mobile banking.

Key words: Micro & small enterprises, mobile banking, operations efficiency, improved service, procurement efficiency, paperless transactions, and risk management.

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ABBREVIATIONS

ATM: Automated Teller Machine

BFM: Bank Focused Model

CBK: Central Bank of Kenya

ICT: Information Communication & Technology

IT: Information Technology

MSEs: Micro & Small Enterprises

ROK: Republic of Kenya

TAM: Technology Acceptance Model

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CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The banking industry today is undergoing a radical transformation caused by globalization and technological advances of the 21st century including; new products, new players and new channels. This transformation is taking place across all sectors of the banking industry (Ojanji, 2013). Information technology is one of the major issues on any bank chief executive's agenda, thrust into prominence by the massive and increasing magnitude of its costs at a time when competitive pressure has never been greater (Narteh&Kuada, 2014).

Coleman (2008) posits that the introduction of electronic banking (e-banking) has altered and redefined the ways banks operate. Technology is increasingly being considered as the main contribution for the organizations' success and their core competencies. Subsequently, banks are investing more on providing the customers with the new technologies through e-banking. E-banking can be described as the provision of banking products and services through electronic channels including Automatic Teller Machines, the internet and telecommunication devices. E-banking has been viewed as a revolution progress in the banking industry. To remain agile and responsive to ever dynamic customer demands, many banks have incorporated 24-hour telephone banking systems and implemented important e-banking systems which allow their customers to perform a diverse number of transactions.

Thegeya and Demombynes (2010) postulate that the new banking environment is about providing differentiating banking products, increased accessibility, convenience and ensuring security to the customers. In this light, Kenya has undergone a remarkable information and communications technology (ICT) revolution. At the close of the 1990s, less than 3 percent of Kenyan households owned a telephone, and fewer than 1 in 1,000 Kenyan adults had mobile phone service. By the end of 2011, 93 percent of Kenyan households owned a mobile phone. The remarkable gains made towards mobile phone access have seen a steady progress in the scope of innovations emanating from exploitation of these fairly new technologies. What has characterized the Kenyan mobile landscape is a rapid uptake of various services key among them

the mobile based products. Mobile banking is one innovation which has progressively rendered itself in pervasive ways cutting across numerous sectors of economy and industry.

Prasad (2009) argues that electronic banking technologies have proliferated in recent years, and the availability of a wide range of products has led to increasing adoption among consumers. These technologies include direct deposit, computer banking, stored value cards, and debit cards. Banks and other financial institutions have worked hard to develop and deploy these technologies because of their potential to increase efficiency, cut costs, and attract new customers. Consumers are attracted to these technologies because of convenience, increasing ease of use, and, in some instances, cost savings.

According to Servon and Kaestner (2008), electronic banking, in particular, has grown at impressive rates. Between 1995 and 2003, e-banking increased eightfold. Between late 2002 and early 2005, use of online banking increased 47 percent. There is some evidence that computer banking is associated with better household financial management. However, financial literacy, the digital divide, and other issues that separate disadvantaged groups from the financial mainstream make it difficult for low- and moderate-income hence the need for mobile banking strategies.

Kio (2011) in his study on the extent of mobile commerce adoption by selected small and medium enterprises (SMEs) in the central business district of Nairobi, Kenya found out that SMEs are adopters of mobile phone money transfer as an application of m - commerce. The results indicated that m - commerce is in its early adoption stage and SMEs have not fully adopted m - commerce as the single most technology to gain a competitive advantage. Though the study appreciates the role of e-commerce in enhancing the competitiveness of the SMEs, the study fails to investigate the benefits and critical success factors in the adoption and implementation of mobile banking which is one of the objectives of the current study.

1.1.1 Mobile Banking in Kenya

Roettgers (2009) argues that, the terms Mobile Phone banking and mobile banking (M-Banking) are used interchangeably. According to them, the term M-Banking is used to denote the access to banking services and facilities offered by financial institutions such as account-based savings, payment transactions and other products by use of an electronic mobile device.

It may also collectively refer to a set of applications that enable people to use their mobile telephones to manipulate their bank accounts, store value in an account linked to their handsets, transfer funds or even access credit or insurance products.

Sloan and Tavneet (2010) portend that, the uptake of mobile phones in Kenya has been unprecedented. Of vital significance is the rapid absorption of mobile based banking services. This trend of continued reliance on mobile devices to execute monetary transactions is steadily gaining momentum. Mobile money systems consist of electronic money accounts that can be accessed via mobile telephones. They are often likened to simple bank accounts, although a basic mobile money system does not pay interest or provide loans.

Each of the mobile service providers in Kenya currently has a mobile money service. Safaricom M-pesa was introduced in March 2007, Zain's Zap (now known as Airtel Money) was initiated in February 2009, yu Cash started in December 2009, and Orange's Orange Money was launched in November 2010. M-pesa is an innovative agent-assisted, mobile phone-based person-to-person payment and money transfer system. M-pesa literally means "mobile money"; *pesa* is the Swahili word for money or cash. It is marketed as a quick, easy, safe and a low cost way to transfer amounts of money from one person to another, transfers from individuals to businesses and cash withdrawals. It is indeed the most sophisticated and best known in the world (Macknon, 2011).

Users can store money on their mobile phones in an electronic account and can deposit or withdraw money in the form of hard currency at one of M-pesa's numerous agent locations. They can also send and receive money from other users and in some cases can pay bills (e.g. electricity) directly to a participating company through M-pesa's pay bill. One can also pay shopping and even pay hospital bills. Kenya's largest mobile phone operator Safaricom launched M-pesa in March 2007 and since then, M-pesa has picked up remarkably quickly, covering the majority of geographic areas of the country. Within four months of its operation, over 250,000 clients, set as a target for year one, became customers (Hughes and Lonie, 2007). About 1 million registered with M-pesa by the end of the first year. By August 2009, about 2.5 years after startup, over 7.7 million Kenyans had become registered users of M-pesa, far exceeding the projections.

As of January 2012, the number had risen to 15.2 million. Today, there are around KSh 2 billion daily M-pesa transactions. There was also a phenomenal growth in the number of agents, from 7,000 in March 2009 to almost 35,000 by January 2012. These agents are located throughout the county (Kuria, 2013).

Initially only a small fraction of Kenyans banked, and given the high costs of transferring money by non-bank means, M-pesa has turned this state around by delivering a wide range of financial and cash management services to a broad swath of people. Around 40% of adult Kenyans now use M-pesa since its introduction in 2007. By employing simple SMS technology and the established communication network of the dominant cell phone company, Safaricom, M-pesa allows for significant sums of money to be stored in phone-based accounts and sent to other users around the country. Deposits and withdrawals can be made through “agents” (Jack & Suri, 2009).

1.1.2 Gikomba Market

While MSEs are distributed across Nairobi County, the study focused on Gikomba market because of its diversity given the fact that the market constitutes a unique combination of formal, informal and semi-informal business enterprises. Thus, there are various business categories operating in the market ranging from; timber & furniture, banking services, agricultural & food commodities merchandising, hardware & building material, new and second-hand clothing, catering, transport services, amongst others.

Gikomba Market sprawls chaotically on either side of the Nairobi River in Kenya’s capital and then spills into the ‘informal settlement’ of Pumwani Majengo – one of 130 slums in the city. Here, 50,000 of the 1.8 million slum dwellers of Nairobi live and work. You can buy everything you need on the teeming dirt streets of Gikomba. Food, vegetables, household goods, hardware, fish and perhaps the most plentiful item of all – second hand clothes or ‘mitumba’ as the clothes trade is called locally. Shipped into Kenya in huge quantities, the clothes and shoes are sold by item or weight on makeshift stalls and from boxes, barrows and carts (Ross & Smith, 2006).

Gikomba is one of the largest open-air markets in East Africa and it is visited every day by tens of thousands of people buying goods, trading, meeting, hawking and simply trying to survive. While most of the businesses in the market are informal, there is a mushrooming of MSEs (micro and small enterprises) in the market which are more formal. The main challenge facing the

traders at Gikomba market has been traditionally flexible banking systems that can allow even the low income earners like the hawkers some basic banking solutions that will act as impetus to savings. The entry of mobile banking therefore has been a major relieve for traders in this market hence the rapid uptake of mobile banking and transactions in place today at the market (Rahman, 2012).

Gikomba market plays a central role in propagating the economy of the country. A key agenda of the 2030 vision is the promotion of entrepreneurship and creation of jobs in the informal sector. The government is particularly keen on empowering the youth and women by encouraging them to run small business units in order to achieve this goal hence the significance of Gikomba market (Economic Review, 2012).

1.1.3 Operations Efficiency

Sloan and Suri (2010) contend that, traders can realize operational efficiencies by adopting an integrated channel strategy that includes mobile banking. The cost of processing a transaction via mobile phone can be as much as 10 times lower than via an ATM and as much as 50 times lower than via a branch. As banks develop their strategies for giving customers access to their accounts through cell phones and other mobile devices, they also regard this emerging platform as a potential catalyst for generating operational efficiencies and as a vehicle for new revenue sources particularly in the informal sector. Cater (2014) defines efficiency as the ability to do something or produce something without wasting materials, time, or energy.

The efficiency hypothesis posits that business organizations earn high profits because they are more efficient than others. There are also two distinct approaches within the efficiency; the X-efficiency and Scale-efficiency hypothesis. According to the X-efficiency approach more efficient firms are more profitable because of their lower costs. Mobile banking will thus help Gikomba traders reduce transaction costs as well as increase customer engagement and retention thereby improving their financial performance (Jack, 2009).

1.2 Statement of the Problem

A number of studies have been carried out on mobile and electronic banking in Kenya. Nderitu (2010) in his study on the impact of mobile banking in Kenya found out that; indeed M-Pesa had a huge impact on the Kenyan society both economically and socially. His findings however fall

short of establishing the actual impact of mobile banking on the performance of business organizations particularly in the informal sector which is the domain of the current study.

Adrian and Njenga (2012) in their study on Mobile phone banking usage in Kenya found out that; the demands of vibrant M-banking implementations revolve around improved network coverage, quality connections besides reduced costs to ensure affordability to all prospective partakers. Their findings however fail to determine any link between mobile banking and firm competitiveness. Despite the shortfall, the current study will use some of their approaches in determining the level of adoption of mobile banking at Gikomba market.

Kio (2011) in his study on the extent of mobile commerce adoption by selected small and medium enterprises in the central business district of Nairobi, Kenya found out that; SMEs are adopters of mobile phone money transfer as an application of m - commerce. Though the study appreciates the role of e-commerce in enhancing the competitiveness of the SMEs, the study fails to investigate the benefits and critical success factors in the adoption and implementation of mobile banking.

There is a plethora of literature available on various online banking services and consumer adoption. However, the literature on mobile banking services in case of Kenya is limited to a few, which justifies the need to carry out this research. Although there is evidence of research on the strategy of mobile banking, it is still clear that there is little known research on the role mobile banking plays in coming up with these efficient operations strategies among MSEs particularly in the informal sector. Against this backdrop, conflicting opinions and increased pessimism about the value of mobile banking abound the banking literature. Given that mobile banking is increasingly being adopted by many banks in Kenya as a strategic orientation, the conflicting academic and practitioner opinions on its impact on the operations efficiency of MSEs has not been exhaustively investigated. It is therefore important to study the phenomenon of mobile banking in greater depth and especially its contributions to operations efficiency. Thus the study sought to investigate the influence of mobile banking on the operations efficiency of MSEs at Gikomba market.

1.3 General Objective

The study set out to investigate how mobile banking influences the efficiency of Micro and Small Enterprises in Gikomba market.

1.4 Specific Research Objectives

The objectives of the study were;

- i. To examine the effect of procurement efficiency on the operational efficiency of MSEs at Gikomba market,
- ii. To investigate the influence of improved service on the operational efficiency of MSEs at Gikomba market,
- iii. To assess the effect of paperless transactions on the operational efficiency of MSEs at Gikomba market, and
- iv. To examine the effect of risk management on operational efficiency among MSEs at Gikomba market.

1.5 Research Questions

The study sought to answer the following questions:

- i. What is the effect of procurement efficiency on operational efficiency of MSEs at Gikomba market?
- ii. What is the relationship between improved service and the operational efficiency of MSEs at Gikomba market?
- iii. How do paperless transactions affect the operational efficiency of MSEs at Gikomba market?
- iv. What is the relationship between risk management and the operational efficiency of MSEs at Gikomba market?

1.6 Assumption of the Study

The study was based on the assumptions that: the proprietors of MSEs at Gikomba market use mobile phones and have embraced mobile banking at least for the past one year; and that the MSEs are profit oriented.

1.7 Scope of the Study

The study sought to determine how mobile banking influences; procurement efficiency, improved service delivery, paperless transactions and risk management of the MSEs at Gikomba market. In addition, the study focused on the benefits and enabling factors that foster the adoption of mobile banking at Gikomba. Gikomba market was segmented into three zones including; Kariokor, Gikomba – Kombomunyiri Road and the Shauri Moyo Metalworks Jua Kali market. A sampling frame was then drawn from the Nairobi City Council License register of 2011.

1.8 Significance of the Study

The study will be of importance to the following parties;

Micro and Small Enterprises

The findings of this study will provide vital information on the role of mobile banking in enhancing the operations efficiency of MSEs. In this context, the study will therefore provide critical information for strategic planning among the MSEs not only at Gikomba but across the country.

Government Economic Policy Makers

The findings of this study will be of importance to economic policy makers. Savings being an important economic variable needs to be mobilized in order to create capital for undertaking investments.

Academia

The study will also be important to other scholars and researchers interested in learning more about the effect of mobile banking on firm performance. It will build up a body of knowledge that will be useful to both current and future scholars.

Financial Institutions

Managers of financial institutions will find the study immensely important particularly because commercial banks are the main mobilizers of savings through deposit funds. They will be keen to

know the findings of the study not only because a positive effect of mobile banking on savings competes with their efforts to mobilize savings, but also to use the findings to tailor their products in such a way that they can partner with mobile companies to mobilize even further deposits from clients they were previously unable to reach.

1.9 Definitions of the Terms

Operational efficiency: - refers to the ability to deliver products and services cost effectively without sacrificing quality (Ciemleja & Natalja, 2011; Aduka, 2010).

Procurement efficiency: - refers to the ratio of total expenditure of the procurement department to total operations budget of a firm (Zuker, 2013).

Paperless transactions: - refers to Communications and technology of relating to or denoting a means of communication that does not use paper (Nderitu, 2010).

Risk management: In the realm of finance, risk management refers to the practice of identifying potential risks in advance, analyzing them and taking precautionary steps to reduce/curb the risk (Katrin, 2011).

Mobile banking: - Mobile banking can be defined as the ability to conduct bank transactions via a mobile device, or more broadly – to conduct financial transactions via a mobile terminal (Kim & Bongshik, 2009).

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews theoretical and empirical literature from past studies on the subject of mobile banking. The chapter focuses on; mobile banking adoption, benefits of mobile banking, critical success factors in the implementation of mobile banking, and the impact of mobile banking on business performance.

2.2 Theoretical Framework

In Kenya particularly among the informal business community, access to mainstream financial institutions, such as banks, credit unions, and Community Development Financial Institutions, is tenuous because of poor credit histories, insufficient and inconsistent cash flows, and lack of financial literacy. Race- and gender-based discrimination likely also plays a role (Bates, 2000; Immergluck, 2012).

According to Angulove et al. (2008), banks and other financial institutions have worked hard to develop and deploy these technologies because of their potential to increase efficiency, cut costs, and attract new customers. Consumers are attracted to these technologies because of convenience, increasing ease of use, and, in some instances, cost savings. A wide spectrum of mobile banking models is evolving. However no matter what business model, if mobile banking is being used to attract low income population in often rural locations, the business model will depend on the banking agent. The models of branchless banking can be classified into three broad categories:

2.2.1 Bank-Focused Model (BFM)

In this model the technological physical infrastructure of a mobile operator is used to provide some basic banking services like balance enquiry, fund transfer, payments for goods and services at merchant outlets using bank account. This is done through ATM, Debit card and Phone SMS. Most of these services are already being provided by banks and are covered under existing regulations. Evidence suggests that this type of activity is already gearing up in Kenya (Scarborough et al., 2010).

2.2.2 Bank-Led Model

In this model, agents like mobile operators and retail outlets generally play a significant role in provision of banking services to end customers. This model is, therefore, prone to agent related risks. These agent-related risks can be mitigated by making banks fully liable for actions of their agents and by giving regulators power to review agents' record of bank related transactions. The beauty of this model is that it can be implemented incrementally starting from most basic activities and gradually adding more and more activities as market participants as well as regulators become more experienced (Keli, 2012).

2.2.3 Nonbank-Led Model

In this model, customers do not deal with a bank, nor do they maintain a bank account. Instead, customers deal with a non-bank firm, either a mobile network operator or prepaid card issuer and retail agents serve as the point of customer contact. Customers exchange their cash for e-money stored in a virtual e-money account on the non-bank's server, which is not linked to a bank account in the individual's name (Anong& Irina, 2013).

This model is riskier as the regulatory environment in which these non-banks operate. For example in Pakistan does not give much importance to issues related to customer identification, which may lead to significant risks. Bringing in a culture of know your customer (KYC) to this segment will be a major challenge. Further the non-banks are not much regulated in areas of transparent documentation and record keeping which is a prerequisite for a safe financial system (Kim & Bongshik, 2009).

2.3 Mobile Banking and Efficiency of MSEs

MSEs are socially and economically important for their national economies, since they represent about 99 per cent of all active enterprises in any given country. The importance of MSEs to the economy indicates the need to assess their performance in order to find appropriate performance measurement and management tools. Making profit is most often mentioned as an integral goal of any enterprise. However, it should be emphasized that profit is the result of a comprehensive process of the creation of added value. This process can be managed by using a system approach. It means that the value maximization opportunities depend on harmonious and purposeful interactions between enterprises separate processes or functional units (Ciemleja&Natalja, 2011).

Development of any enterprise is related to the future opportunities, risks and uncertainty. Therefore, profit making ability of an enterprise depends on managers' skills to apply modern business management methods and tools. The more mature are the business activities, the higher is the probability of an enterprise to face failure. Long-term existence of an enterprise depends on its ability to utilize resources efficiently and to create profit, taking into consideration the influence of business environment and its related factors. While measuring the performance of an enterprise, the company's life cycle concept should be considered (Bedman&Kuada, 2014).

Beer (1973) asserts that in order to improve efficiency of the system, which results from both enterprise management and government efficiency, also small enterprises shall seriously turn to evaluation of its performance. Performance measures characterize the fulfillment of goals, but they can be used also as a strategic tool of the enterprise management. Efficiency can be evaluated based on enterprise indicators (liquidity, profitability and productivity) while providing sustainability of the system.

Use of and investment in ICT requires complementary investments in skills, organization and innovation and investment and change entails risks and costs as well as bringing potential benefits. There are positive impacts of mobile banking on MSEs turnover and profitability and to a lesser extent on employment, most notably when mobile commerce is part of larger business network. The use of mobile banking can contribute to improved efficiency, in terms of increased market share, expanded product range, customized products and better response to client demand. Mobile banking is gradually revolutionizing business processes and their income structure at the micro-level (Bartram &Areztez, 2010).

2.4 Mobile Banking Systems

Suri et al. (2010) portend that, the terms *m-banking*, *m-payments*, *m-transfers*, *m-payments*, and *m-finances* refer collectively to a set of applications that enable people to use their mobile telephones to manipulate their bank accounts, store value in an account linked to their handsets and transfer funds. Mobile commerce is different. Mobile commerce in this case can be defined as; as the use of handheld devices to carry out transactions (Kim &Bongshik, 2009).

Baraka and Sengo (2013) attribute the rapid growth in mobile money in Kenya to four factors: a conducive legal and tax environment, private-public policy dialogue, strategic and prudent

macroeconomic policies, and a guarantee of the existence of a contestable market discouraging dominance by initial entrants. Comminos (2008) argue that the initial success of Kenya's mobile money transfer industry can be attributed to the high demand for remittances generated by rural/urban migration, while its rapid scaling is due to the mobile providers' growth strategy.

By complementing services offered by the banking system, such as checkbooks, ATMs, voicemail/landline interfaces, smart cards, point-of-sale networks, and internet resources, the mobile platform offers a convenient additional method for managing money without handling cash (Karjalainen, 2002). In Kenya and the larger developing world, the appeal of these m-banking/m-payments systems may be less about convenience and more about accessibility and affordability (Cracknell, 2004). An exploration is underway between banks, mobile operators, hardware and software providers, regulatory agencies, donors, and users to determine the shape of m-banking/m-payments services in the developing world (Ivatury, 2004; Ivatury & Pickens, 2006; Porteous, 2006).

Mulupi (2010) argues that, mobile phone operators have identified m-banking/m-payments systems as a potential service to offer customers, increasing loyalty while generating fees and messaging charges. Financial institutions, which have had difficulty providing profitable services through traditional channels to poor clients, see m-banking/m-payments as a form of "branchless banking", which lowers the costs of serving low-income customers. Government regulators see a similar appeal but are working out the legal implications of the technologies, particularly concerning security and taxation.

According to Porteous (2006), there are two aspects to mobile banking. These include additive aspect and the transformational aspect. Additive aspects are those in which the mobile phone is merely another channel to an existing bank account. Mobile banking is additive when it merely adds to the range of choices or enhances the convenience of existing customers of mainstream financial institutions. Transformational characteristics arise when the financial product linked to the use of the phone is targeted at persons who do not hold formal bank accounts with the conventional banking institutions. It is the second aspect of mobile banking that this study will concentrate on. The transformational mobile banking is made available by mobile phone service providers as part of their value added services. It is embedded among other services within the

service providers menu. The perceived difference between mobile service providers mainly lies on the pricing strategy, quality and scope of services (Kim & Bongshik, 2009).

Graham (2009) asserts that most m-banking/m-payments systems in the developing world enable users to do three things: Store value (currency) in an account accessible via the handset. If the user already has a *m-banking* bank account, this is generally a question of linking to a bank account. If the user does not have an account, then the process creates a bank account for her; convert cash in and out of the stored value account. If the account is linked to a bank account, then users can visit banks to cash-in and cash-out; in many cases, users can also visit the mobile service providers' retail stores (Porteuos, 2006).

In the most flexible services, a user can visit a corner kiosk or grocery store perhaps the same one where he or she purchases airtime and transact with an independent retailer working as an agent for the transaction system. Transfer stored value between accounts. Users can generally transfer funds between accounts linked to two mobile phones, by using a set of SMS messages (or menu commands) and PIN numbers (Ndungu, 2013).

The new services offer a way to move money from place to place and present an alternative to the payment systems offered by banks, remittance firms, pawn shops, etc. The uptake of m-banking/m-payments systems has been particularly strong in the Philippines, this is according to study done by Owen, John and Bantug (2006). The study asserts small and medium sized businesses make up 99.6% of the total business and most have no access to financial services, the Philippines Central Bank came to their aid and ensured a regulatory that made this organization engage in banking services. They created a group to supervise the development of the mobile banking. Over 3 million customers use the system offered by mobile operators Smart and Globe i.e. Smart Money and Globe G-Cash respectively. Mobile banking services help in expanding the reach of the microfinance (Clement, 2007).

2.5 Financial Control through Mobile Savings

Mas and Radcliffe (2010) argue that, M-pesa, the first mobile money system in Kenya, was originally developed primarily as a money transfer device and was attractive because it allowed people to send remittances across distance at low cost. The system has become popular for other uses, including storing credit. The term mobile savings has been used to describe this

phenomenon. Bank-integrated mobile savings approaches have received a great deal of attention as a way to provide banking services to the poor. They have the advantage of offering access to basic banking services without requiring proximity to a physical bank branch. Instead, with a bank integrated mobile savings account, basic banking services can be accessed via a network of mobile phone agents, which in Kenya outnumber the number of bank branches by a factor of 100 to 1.

By December 2010, there were at least seven systems offering some type of bank account access via mobile phone. Most of these are essentially access to a traditional account via a mobile phone and require the customer first to establish a traditional account at a physical bank. We term these *partially* integrated mobile savings systems. Separately, M-kesho, a joint venture between Equity Bank and Safaricom, can be considered a *fully* integrated mobile savings system, as it does not require a traditional bank account: customers can sign up via Safaricom agents. M-kesho had 613,000 subscribers in the six months after its launch (Kuria, 2009).

The market has since rapidly expanded as more banks have structured agreements with the mobile service providers. Bank-mobile service provider partnerships are not exclusive, and banks are seeking agreements with multiple mobile service providers with the ultimate aim of providing universal access to their diverse client account bases.

Additionally, banks are beginning to build their own agent networks in order to assume a more competitive bargaining position in accessing mobile service platforms. Partially and fully integrated savings present different types of contracts among the partnering bank and mobile service provider (Ojanji, 2013).

A partially integrated product clearly delineates the role of the bank, which provides and owns banking services, and the mobile service provider, which provides the mobile telephony infrastructure and controls the agent network. The bank compensates the mobile service provider for access to the network and enjoys the remaining profits. This type of contract more closely resembles a debt contract between the parties. A fully integrated solution may not draw the same distinction between bank and mobile service provider. In this case, the distribution of surplus depends on the relative bargaining power of the bank and mobile service provider. This type of contract more closely resembles an equity contract between the parties. Equity-like contracts are

likely to be more complex and therefore more difficult to negotiate than debt-like contracts, thereby presenting a potential hurdle towards the goal of increasing access (Ronald, 2012).

The young urban citizens who are better educated and earn higher incomes send money to their rural folks through their mobile phones. Due to the increasing penetration of mobile phones even into poor communities, mobile payment schemes could bring formal financial services to the “unbanked”. However, because poverty for the most part also correlates with low levels of formal education, there are questions as to whether electronic access to complex financial services is enough bridge between poverty and financial freedom (Kaestner&Servon, 2008).

Unbanked people, who are by far the majority in most developing countries, are in fact a heterogeneous group, including people who may have adequate income but from an informal source, as well as poor, and rural dwellers. One view is that mobile technology is just another, although highly innovative, access channel; an alternative is that mobile telecommunications networks are becoming the ‘front office’ for financial services leaving the existing banks as providers of back office functions (Ronald, 2012).

But there is also another view which seeks to define the competitive advantages of the banking and mobile finance business models and then explore the ways in which these could give rise to new market structures within which the existing portfolio of financial services (savings, credits and transactions) can be unbundled. There are a number of mobile transaction initiatives in the developed and developing world. Most are bank-led and largely provide an information and transaction channel which complements existing bank access channels such as branches, telephone banking and online services. There are, however, significant examples of innovative mobile transaction schemes that hint at a radical transformation of the financial market landscape in that the business model addresses those without existing bank accounts. Low income customers use mobile banking due to its convenience, availability and affordability as is the case with Globe in the Philippines and M-pesa in Kenya (Kim & Bongshik, 2009).

In addition there are mobile financial transaction models which make innovative use of existing widely-diffused financial service platforms, such as Visa, in order to deliver transaction services to underserved market segments. Interestingly, the most innovative of these mobile banking models, and those with the greatest potential to bring significant benefits to consumers, are those

addressing the needs of developing markets, which hitherto have been the most complex in which to increase access to finance. According to Morawczynski (2009) more remittances are made from urban to rural areas which account for 70% of their total household income. The study also suggests that the M-pesa users are sometimes unable to enjoy the services due to network congestion since it also uses same technology as the one that supports the text messages and low floats among the agents (Zuker, 2010).

2.6 Critical Success Factors in the Implementation of Mobile banking

Dione (2013) argue that, though mobile banking is ultimately used by retail traders, the institutions that implement mobile banking strategies have a role to play in ensuring their final success. Notwithstanding the significant benefits of mobile banking and its capabilities, its risks and challenges that are recognized and need to be managed by banking institutions in a prudent and professional manner. The enabling factors in the adoption and implementation of mobile banking are discussed in the subsequent sections.

2.6.1 Digital Nature of the Offering

While mobility and itinerancy are some of the characteristics final users are seeking when they opt for a mobile device; being mobile does not necessary translate into the use of the technology in a nomadic state. What distinguishes mobile from fixed electronic commerce is the ability to conduct business transactions from any place at any time. In such, through m-commerce, users might carry out value-added business interactions that are not available through fixed Internet connections. It is therefore clear that not all commercial activities are well suited for mobile commerce. For example, the small graphical interface on the mobile terminal restricts the completion of complex business interactions that may require more information to be displayed simultaneously. However, Viswanath, Shuk and Kwo, (2003) argue that small screen size, limited screen resolution and difficult input mechanisms are some limitations of mobile terminals that have since emerged over (Miguel and Stoll, 2013).

2.6.2 Top Management Commitment

The top executives of the respective organizations must fully support and commit to mobile banking for it to succeed. The top management must be committed both in word and in execution. The top managers of business organizations must commit resources to facilitate

mobile banking in order to: enhance cost cutting; new revenue potential; improved competitiveness; and quality of products and services because of perceived benefits of mobile banking. On the other hand, some organizations are faced with having top managers and employees who are resistance to change and this may cause an organization to lag behind in this competitive world. According to Tolbert and Zuker (2003) innovation of IT would be more likely if the political environment within an organization has norms favoring the change. Thus, when there is support from top management adopting of e-banking would be easy and smooth. Management support has been identified as crucial in the acquisition of innovation (Kangogo, 2013).

2.6.3 Operational Risk

Operational risk of mobile banking is the central of system availability and security to the dependability on new technology which provides services. Security threats can be internal or external to the system such as system hacking, viruses and due to this, banking regulators and supervisors must ensure that banks have the right measures in place to secure data integrity and confidentiality for the institution and customers. These security practices should be tested on a regular basis by technical skilled personnel to analyze network vulnerabilities and recovery preparedness. Money laundering has increased over the years because of the growth and usage of mobile banking services.

Katrin (2011) asserts that the level of security or risk associated with adoption of mobile banking is a major factor affecting the acceptance and adoption of the mobile banking products. Even in countries where electronic banking has long been established, one of the most important factors slowing progress of this new innovation is the customers concern for security of financial transactions over the Internet and electronic means. Therefore, security is one of the very important factors in determining the decision of customers to use e-banking platform. Similarly, security concerns are keeping both consumers away from mobile banking.

2.6.4 Adequate ICT Personnel to Handle Mobile-Banking

The greatest challenge facing developing countries is the development of the qualified human capital needed to operate a modern economy and society effectively and especially in firms like the banks which need more qualified technical experts of the IT because of sensitivity of transactions involved (Dione, 2013).

Lack of well trained and up to date IT personnel may affect value creation in the banking sector since value creation comes in when the input factors which among them the human capital and the infrastructure are well skilled and up to date respectively.

Katrin (2011) furthermore identified that while managers typically have a high-level understanding of their business and operational processes, they often lack employees with the experience and skills necessary to adopt software technologies and educate customers and it's thus the duty of the managers to get the right qualified people for these jobs.

2.6.5 National ICT Policy

The prevailing ICT policy in the country in question must be favorable for smooth implementation of innovative e-banking products and services.

Countries must have priorities which determine the national development agenda for e-banking services. The importance of ICT as a development tool has often been neglected.

ICT usage in most developing countries lags behind the developed world and they have to pull up to be at par. For instance, in Africa, internet user penetration has been less than desirable despite the people having knowledge on the same. The International Telecommunication Union (ITU) projected that by the end of 2010, internet user penetration in Africa was to reach 9.6%. This is relatively very low when compared with the world average of 30% and the developing country average of 21%. This means that generally, in Africa, very few people are familiar with the use of the internet (Katrin, 2011).

2.7 Empirical Review

2.7.1 Procurement Efficiency

The proposition that mobile banking enhances procurement efficiency is augmented by a study by Zuker (2010), which indicate that mobile technology has helped small business units' scale up their operations since its inception in the late 1990s.

A recent *Micro Save* briefing note (Wright et al, 2006) lists the elements of transaction banking which constitute a suitable value proposition for poor customers as; a safe place to keep money, the ability to deposit and withdrawal cash at convenient locations (since cash is still pervasive) at

a reasonable fee, and the ability to transfer money – to make payments and to remit money to friends and relatives. Scholarly research on the adoption and economic impacts of m-banking systems in the developing world is scarce (Maurer, 2008).

2.7.1.1 Research Gap

While the above studies appreciate the fact that technology has a major role to play in revolutionizing small scale businesses, the literature fails to establish the link between mobile banking and procurement efficiency which is the domain of the current study.

2.7.2 Improved Service Delivery

Aduka (2010) carried out studies on the effect of mobile banking on selected macroeconomic factors in Kenya. He used a sample of 44 registered commercial banks and analyzed data using multiple regression models. He found out that with increased improvement and awareness of technology so did the customers registered for mobile banking increased. The study also found out that mobile banking is positively correlated operations efficiency particularly among the MSEs .

2.7.2.1 Research Gap

The findings runs short of determining specific factors that link mobile banking to improved service delivery and the interplay between mobile banking and improved service delivery hence the current study.

2.7.3 Paperless Transactions

Nderitu (2010) studied the impact of mobile banking on economic performance of M-pesa in the Kenya society. He conducted a random survey of M-pesa users. The study found out that M-pesa allows paperless transactions making it the most preferred and dominant money transfer service in Kenya and it has huge impact in the number and average amount of person to person money transfer. It also has a significant economic impact to many low to medium income Kenyans due to the fact that it is mostly paperless (Gordon and Pallister, 2010).

2.7.3.1 Research Gap

Despite recognizing the centrality of mobile banking in money transfer the studies above fail to show a clear connection between paperless banking and operations efficiency more so with regards to MSEs in the informal settings like Gikomba markets

2.7.4 Risk Management

Katrin (2011) in her study found out that the level of security or risk associated with adoption of mobile banking is a major factor affecting the acceptance and adoption of the mobile banking products. Even in countries where electronic banking has long been established, one of the most important factors slowing progress of this new innovation is the customers concern for security of financial transactions over the Internet and electronic means. Therefore, security is one of the very important factors in determining the decision of customers to use e-banking platform. Similarly, security concerns are keeping both consumers away from mobile banking.

2.7.4.1 Research Gap

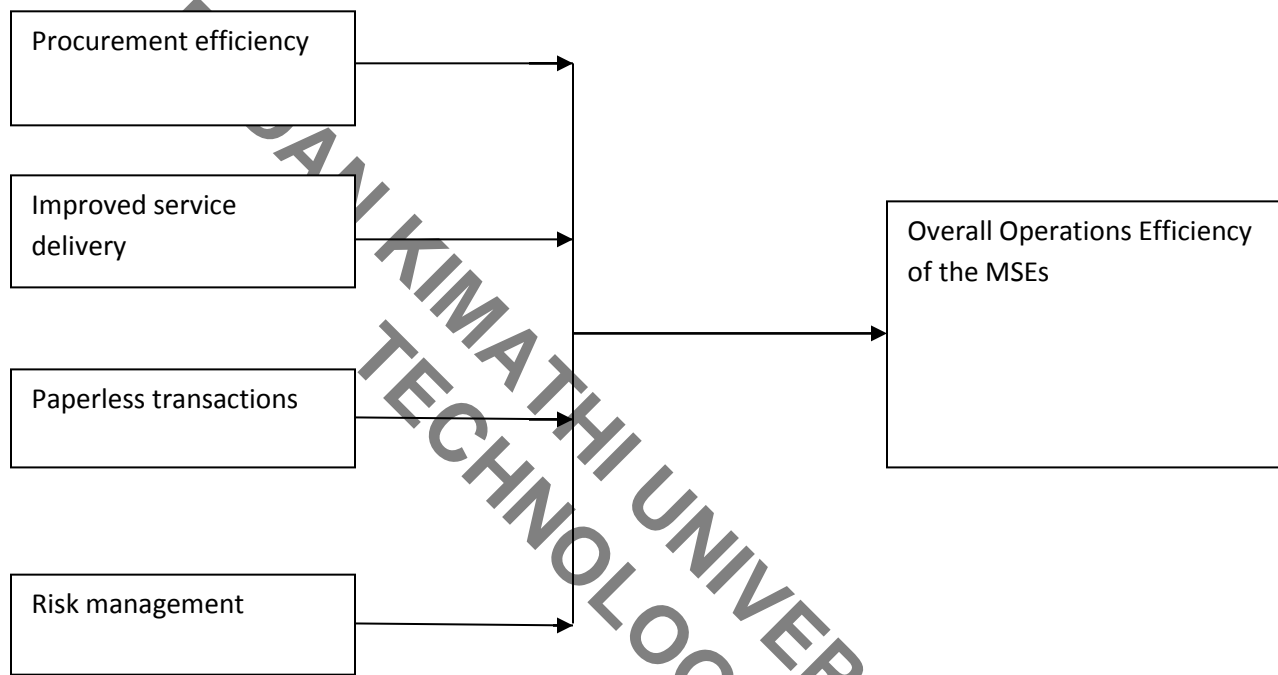
Her findings however fail to expound on how mobile banking mitigate risk particularly concerning paperless money transfers and how through risk management, mobile banking can enhance the operations efficiency of an enterprise. Against this limitation the current study thus seeks to unravel the link between risk management through mobile banking helps improve the efficiency of MSEs.

2.8 Conceptual Frame Work

A conceptual framework is a logically developed, described and elaborated network of interrelationships among variables integral in the dynamics of a situation being investigated (Mertens, 1998). It explains the theory underlying these relationships and describes the nature and direction of these relationships. A variable is a measurable characteristic that assumes different values among the subject. It is therefore a logical way of expressing a particular attribute in a subject (Mugenda and Mugenda, 2003). A dependent variable is the variable of primary interest to the researcher. In the current study the dependent variable was the overall operations efficiency of the enterprise. An independent variable is the one that influences the dependent variable in either a positive or negative way. The independent variables in this case

were: procurement efficiency, improved service delivery, paperless transactions and risk management.

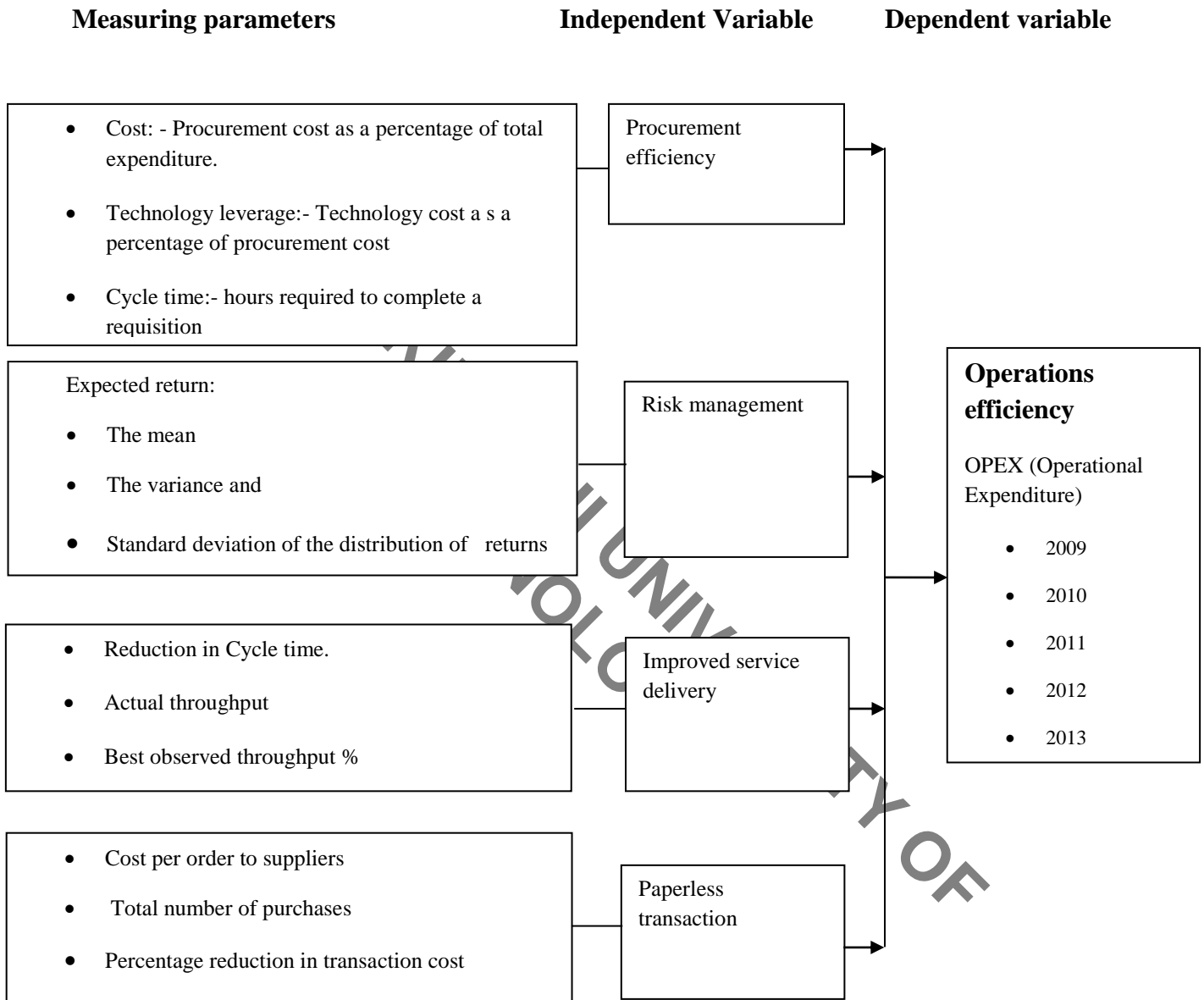
Figure 2.1: The Conceptual Framework for the effects of mobile banking on the efficiency of MSEs



2.9 Operational Framework

This section describes the measuring parameters of both the independent variables and the dependent variables.

Figure 2.2: Operational framework of the study



2.9.1 Variable Measurability

Operations efficiency in a firm is *effective* if it identifies appropriate strategic goals, and *efficient* if it achieves them with minimal resources. *Operational efficiency* has to do with the ability to deliver products and services cost effectively without sacrificing quality. Since operational

efficiency is about the output to input ratio, in the current study it was measured both on the input and the output side. Quite often, company management is measuring primarily on the input side, e.g. the unit production cost or the man hours required to produce one unit. Even though important, input indicators like the unit production cost should not be seen as sole indicators of operational efficiency. The current study used OPEX (Operational Expenditure) as the sole performance indicator.

Operating expenses are defined as non-capital expenses (non capital operating costs) incurred by a company in normal operations, such as salaries and wages and floor space rental. In brief, almost all routine expenditures a company makes in operating a business are operating expenses, except for a few special non-operating expenses such as loan financing costs or one-time plant closing costs, and except for capital spending.

Procurement efficiency: Will be measured by the ratio of total expenditure of the procurement department to total operations budget of the MSEs.

$$Pe = \frac{\text{Total expenditure of the procurement department}}{\text{Total operations budget of the MSEs}} \times 100$$

Improved Service delivery: Will be measured by the extent to which mobile banking leads to the Reduction in Cycle time. Average cycle time to targeted average cycle time % will be applied to assess the variable of improved service delivery.

Paperless transaction: Will be measured by the percentage reduction in transaction cost.

Risk reflects the chance that the actual return on an investment may be very different than the expected return. In the current study risk will be measured by calculating the variance and standard deviation of the distribution of returns using the expected return model below;

$$\text{Var}(R) = \sigma^2 = \sum_{i=1}^N p_i (R_i - E[R])^2$$

2.10 Summary of Literature Review

The ensuing research is based on a summary of the literature thus presented. Much of the review considers empirical works published in academic journals from 1990 to 2014. The review started

by looking at the theoretical perspective of mobile banking by discussing the relevant theories and predispositions on the subject matter. The theoretical discussions give a solid theoretical foundation which guided the arguments in the paper. Key theories discussed in the section include; the bank focused model, the bank led model, and the non-bank led model.

The chapter then delves into reviewing literature on the link between mobile banking and operations efficiency among MSEs. While most studies concur on the positive impact of mobile banking on the performance of MSEs, few of them have established the effect of mobile banking on the operations efficiency of the MSEs. The chapter then moved on to review past empirical and theoretical outcomes on the nature of contemporary mobile banking systems in Kenya and the world. Focus is given to Kenya's M-pesa, lipanaM-pesa models amongst other typologies. From the review most scholars support the thesis that financial innovations particularly in line with mobile banking have had a significant impact on the performance of MSEs not only in Kenya but across the world. Literature on the critical success factors in the adoption and implementation of mobile banking are reviewed in this chapter in which the following critical success factors are discussed; top management support, operation risk management, adequate personnel, and national ICT policy.

The chapter ends with a review of past empirical findings on the topic with a special focus on the objectives and independent variables under study where the respective literature gaps have been identified. The main variable discussed here includes; procurement efficiency, improved service delivery, paperless transactions, and risk management. The current study therefore sought to fill this literature gap by establishing the link mobile banking and operations efficiency among MSEs at Gikomba market.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

Rajasekar (2013) refers research methodology as a systematic way to solve a problem. Essentially, research methodology is about the procedures by which researchers go about their

work of describing, explaining and predicting phenomena. This chapter focuses on; the research design, population, sampling frame and sample size, data collection methods, and data analysis methods that were used in the study.

3.2 Research Design

Kothari & Garg (2014) argues that research design is the conceptual structure within which research is conducted; it constitutes the blueprint for the collection, measurement and analysis of data. As such the design includes an outline of what the researcher will do from writing the hypothesis and its operational implications to the final analysis of data. The study adopted a descriptive survey design. A descriptive survey design enables a researcher obtain large amounts of data from a sizable population in a highly effective, easy and in an economical way using questionnaires. In addition, a descriptive survey enables a researcher obtain quantitative data which he can analyse using descriptive and inferential statistics (Saunders et al., 2002).

3.3 Population

Mugenda and Mugenda (2003) define a population as an aggregate of all that conform to given characteristics. The population of interest in the current study included all the MSEs in Gikomba market. The sampling frame was drawn from the Nairobi City Council License register of 2011 and segmented into three zones as shown in Table 3.1.

Table 3.1: Gikomba market segmentation

Market segment	Total Number of MSEs	Number of licensed MSEs
Kariokor	695	37
Gikomba – KomboMunyiri road	1,142	103
ShauriMoyo - Metal works	911	68
Total	2,748	208

Although the register indicates that there are 2,748 registered businesses within these zones, only 208 businesses are licensed thus forming the target population.

3.4 Sampling Frame & Sample Size

A sample design is a definite plan for obtaining a sample from a given population. It refers to the technique or the procedure the researcher would adopt in selecting items for the sample. Sample design may as well lay down the number of items to be included in the sample. Sample design is determined before data are collected (Kothari & Garg, 2014). From the licensed MSEs population of 208 businesses a 30% random sample of 63 respondents was selected for the study. According to Mugenda and Mugenda (2003), a representative sample is one which is at least 10% of the population thus the choice of 30% is considered as representative. The respondents in the study included the managers of the MSEs.

Table 3.2: The sample

Market segment	Number of licensed MSEs	Sample (30%)
Kariokor	37	11
Gikomba – Kombomuniri road	103	31
Shaurimoyo - Metal works	68	21
Total	208	63

3.5 Data Collection

Primary data was utilized in the study. According to Kothari & Garg (2014) primary data are those which are collected afresh and for the first time, and thus happen to be original in character. Primary data was collected using a semi-structured questionnaire subdivided into two parts. Part 1 consisted of open-ended questions aimed at obtaining general information on the MSEs while Part 2 consisted of questions aimed at obtaining data on mobile banking. The respondents in the study included the general managers of the MSEs owing to the fact that most of the MSEs are run by the owners who act as both the proprietors and the general managers increasing data reliability. A 5-point Likert scale is used to measure the output of each item answered by the participants.

A pilot study was conducted to give the researcher ideas and clues to increase the chances of getting clearer findings in the main study. Porta (2008) postulates that a pilot study is a small-scale test of the methods and procedures to be used on a larger scale. The fundamental aim of undertaking a pilot study was to examine the feasibility of an approach that is intended to

ultimately be used in a larger scale study. The pilot study involved 15 respondents located away from Gikomba market.

According to the findings of the pilot study, the questions in the questionnaire were straight forward and easy to understand after a pre-test was carried out on fifteen MSEs outside the study area. The results of the pilot study thus detected a few errors and for further improvement that were needed in the questionnaires' design. For instance, the questionnaire showed some gaps such as ambiguity in the question, too many questions under each research framework, some questions were too long, etc., and adjustment was made on the research questions before it was finally distributed to the target audience. Consequently the pilot study provided an opportunity to develop consistent practices to enhance data integrity and the protection of human subjects. These good ethical practices include the refinement of source documentation, informed consent procedures, data collection tools, regulatory reporting procedures, and monitoring/oversight procedures, especially when multiple sites and investigators are engaged in the study.

3.6 Reliability

Reliability is the extent to which measurements are repeatable – when different persons perform the measurements, on different occasions, under different conditions, with supposedly alternative instruments which measure the same thing. In sum, reliability is consistency of measurement (Bollen, 1989), or stability of measurement over a variety of conditions in which basically the same results should be obtained (Nunnally, 1978).

Because reliability is consistency of measurement over time or stability of measurement over a variety of conditions, the most commonly used technique to estimate reliability is with a measure of association, the correlation coefficient, often termed reliability coefficient (Rosnow and Rosenthal, 1991). The reliability coefficient is the correlation between two or more variables (here tests, items, or raters) which measure the same thing.

Internal consistency technique was applied to test for reliability during the pilot study. Internal consistency measures consistency within the instrument and questions how well a set of items measures a particular behavior or characteristic within the test. For a test to be internally consistent, estimates of reliability are based on the average intercorrelations among all the single items within a test. The most popular method of testing for internal consistency in the

behavioural sciences is coefficient alpha. The current study employed the Coefficient alpha often referred to as Cronbach's alpha where the individual item would be expected to have only a small correlation with true scores. Thus, if coefficient alpha proved to be very low, either the test is too short or the items have very little in common.

3.7 Validity

Validity is concerned with the meaningfulness of research components. When researchers measure behaviours, they are concerned with whether they are measuring what they intended to measure. There are four types of validity that researchers should consider: statistical conclusion validity, internal validity, constructs validity, and external validity. Researchers therefore endeavor to develop strong support for the validity of their measures (Bollen, 1989). Statistical conclusion validity refers to inferences about whether it is reasonable to presume co variation given a specified alpha level and the obtained variances (Cook & Campbell, 1979).

In the current study, validity was determined by the element of convergent validity and discriminant validity under the wider perspective of construct validity which was captured by the measure of the "goodness of fit" which was 0.78 in the study implying the model is of *high goodness of fit*.

3.8 Data Analysis

Kombo and Tromp (2006) argue that; data analysis involves examining what had been collected and making deductions and inferences. Descriptive statistics were used to describe (and analyse) the variables numerically. These included: simple means; standard deviations regression and correlation analysis by use of SPSS while factor analysis was applied to check on the categorization of the mobile banking practices adopted by MSEs. Factor analysis is a statistical method used to describe variability among observed, correlated variables in terms of a potentially lower number of unobserved variables called factors. Factor analysis is used mostly for data reduction purposes: to get a small set of variables (preferably uncorrelated) from a large set of variables (most of which are correlated to each other); and to create indexes with variables that measure similar things (conceptually).

A multiple regression model was used to analyze the relationship between mobile banking and the operations efficiency of the respective MSEs. Snidjerst & Bosker (2000), outline the rationale for multiple regression analysis based on the following salient features: The fact that conclusions

can be drawn about the correlations between the dependent variables, notably, the extent to which the correlations depend on the individual and on the group level. Such conclusions follow from the partitioning of the covariance's between the dependent variables over the levels of analysis; and the fact that, the tests of specific effects for single dependent variables are more powerful in the multiple analysis.

The multiple regression model was computed as follows;

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

Where;

Y = Operations efficiency (Productivity)

β_0 =Constant

$\beta_1, \beta_2, \beta_3, \beta_4$, = Coefficients of determination

X_1 = Procurement efficiency

X_2 = Improved service delivery

X_3 = Paperless transactions e.g. Lipana M-pesa

X_4 = Risk management

3.9 Ethical Consideration

Jones (2004) suggests that differing researcher values and attitudes create four different and contradictory motivations for conducting research in organizations, and that each of these creates a different relationship between researcher, organization, participants, and society. She calls these motivations consultancy, instrumental academic, co-consultancy, and academic research. To uphold current research ethics, the study was conducted within the frame work of the ethics and research review committee at DedanKimathi University of Technology under the tutorage of experienced supervisors.

CHAPTER FOUR

DATA ANALYSIS, FINDINGS, DISCUSSIONS AND CONCLUSIONS

4.1 Introduction

Data on mobile banking practices adopted by MSEs and their effect on their operations efficiency was analysed. The demographic data was examined using descriptive statistics and summarized in various frequency tables. With the help of SPSS statistical software, data on mobile banking practices adopted was analysed using; mean scores, standard deviations, coefficients of variation, regression analysis and factor analysis. The factors were ranked in order of importance, the correlation between them yielded the key factors that loaded most on the components and therefore had the greatest influence on the operations efficiency. Sixty- three (63) questionnaires were administered to the selected MSEs. Fifty- two (52) of these questionnaires were returned representing a response rate of 83percent. The analysis, findings, and discussion are presented below.

4.2 Demographic Information

The demographic characteristics of the respondents that were tested include literacy level of the proprietors and the age of the enterprise.

4.2.1 Literacy Level of the Proprietors

There exists a positive correlation between the adoption of technology and the literacy level of an individual. The study sought to determine the academic qualifications for the respondents. The respondents were required to indicate their highest academic achievements the results in Table 4.1.

Table 4.1: Literacy level of the proprietors

Academic qualifications	Frequency	Percentage
Bachelor's degree	9	17.31
Diploma	10	19.23
Master's degree	6	11.54
Secondary	18	34.62
Primary	5	9.62
Others	4	7.69
Total	52	100

The findings in Table 4.1 show that most of the MSEs proprietors in the market are secondary school graduates at 34.62% followed by diploma holders at 19.23%. Relatively few bachelor's and master's degree holders operate in the market at 17.31% and 11.54% respectively.

Proprietors with other qualifications run the least enterprises representing only 7.69% of the operators. These findings are consistent with the reality in Kenya where entrepreneurs in the informal sector have traditionally been associated with low academic qualifications (Gordon and Pallister, 2010). However the fact that bachelor's and master's degree holders cumulatively account for 28.85% of the operators in the market is a clear indication that the government's effort to encourage entrepreneurship and job creation for the last decade is slowly bearing fruit (RoK Economic survey, 2014).

4.2.2 Age Distribution of the MSEs

The study sought to investigate the length of time the respective MSEs have been in operation in a bid to correlate business experience with mobile banking. The respondents were required to indicate the number of years that they have been operating at Gikomba market. The results are indicated in Table 4.2.

Table 4.2 Age distribution of the MSEs

Number of years in operation	Frequency	Percentage
1-5 yrs	20	38.46
6-10 yrs	5	9.62
11-15 yrs	9	17.31
16-20 yrs	10	19.23
Over 21 yrs	8	15.38
Total	52	100

From the findings in Table 4.2 above, it is clear that most MSEs at Gikomba market have been in operation for a period of 1-5 years at 38.46% followed by those which have been in operation for a period of 16-20 years at 19.23%. MSEs which have been in operations for a period between 6-10 years are the least at 9.62%.

4.2.3 Level of Awareness of Mobile Banking

Successful adoption and implementation of a technology depends on the extent to which the respective strategies are adopted by key stakeholders. The study sought to determine the number of MSEs proprietors that are aware of mobile banking. The results are shown in Table 4.3.

Table 4.3: Extent of adoption of mobile banking

Number of proprietors who understand mobile banking	Frequency	Percentage
Proprietor understands mobile banking	33	63
Proprietor does not understand mobile banking	19	37
Total	52	100

The results in Table 4.3 above indicate that 63% of the MSEs at least understand what mobile banking is. This compliments the RoK's economic survey of 2014 which portends that the last half a decade has seen a drastic increase in mobile connection in Kenya. The findings support those of Nderitu (2010) who found out that mobile and electronic banking has significantly enhanced the efficiency of money transfer and e-payment in the last two decades. The findings however divert from those of Thegeya et al. (2010) who using a pyramid market model found out that; implementing technologies for financial service innovation is largely influenced by the enabling factors in place.

4.3 Mobile Banking

Mobile banking is fast becoming the best strategy in promoting banking today not only in Kenya but across Sub-Saharan Africa due to its agility and scalability. The study sought to determine; the various mobile banking practices and the extent to which they have been adopted by MSEs at Gikomba market, and to establish the relationship between mobile banking and the operations efficiency of the MSEs.

4.3.1 Mobile Banking Practices

The effectiveness of a mobile banking process lies in the implementation of specific mobile banking practices. The study sought to determine the various mobile approaches/ practices undertaken by the MSEs in their core functions. In the initial step, a correlation matrix was generated to identify any significant relation between the items. Factor analysis was applied where in the initial step; a correlation matrix was generated to identify any significant relation between the items. The number of factors corresponded to the number of responses to the questions on mobile banking practices. Respondents were required to state the extent to which they have adopted various mobile banking practices on a likert scale of 1-5 where: 1 = Very

large extent; 2= Large extent; 3 = Moderate extent; 4 = Small extent; and 5 = No extent. The results are presented in Table 4.4.

Table 4.4: Descriptive Statistics (mobile banking)

	N	Minimum	Maximum	Mean		Std. Deviation	Variance
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
Procurement	52	1.00	5.00	1.5577	.1329	.9582	.918
Improved service delivery	52	1.00	5.00	2.8654	.1903	1.3724	1.883
Risk management	52	1.00	5.00	2.1923	.1578	1.1383	1.296
Sales promotion	52	1.00	4.00	1.4038	.1107	.7985	.638
Remote banking	52	1.00	4.00	1.2885	7.929	.5718	.327
Better response to customer demand	52	1.00	5.00	3.5000	.1990	1.4349	2.059
Better payment	52	1.00	2.00	1.1923	5.519	.3980	.158
Sales up scaling	52	1.0	5.0	3.019	.197	1.421	2.019

Going by the findings in Table 4.4 above, the use of mobiles for better payment has the lowest mean of 1.1923 and standard deviation of 0.398 indicating that better payment is the mobile banking practices that is used to the largest extent by the MSEs at Gikomba market. The use mobile phones to respond to customer demand the highest mean and standard deviation at 3.5 and 1.4349 is the least adopted mobile banking practice ranking adopted to a small extent on the likert scale. From the results in Table 4.4 it is apparent that while the use of mobile phones for better response to customer demand is practiced to a small extent, it exerts the most influence on the variation in the operations efficiency of the MSEs with the highest standard deviation at 1.4349. The findings above complement those of Ciemleja & Nataljia (2011) who found out that mobile uptake in Kenya has enhanced the responsiveness of entrepreneurs particularly in the informal sector in Kenya.

Before factor extraction, there were eight eigenvectors which corresponded to the number of factors. Three principal components were extracted for mobile banking practices. Observation indicated that the three decision factors accounted for 63.39% of the total variation as illustrated in Table 4.5.

Table 4.5 Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.347	29.335	29.335	2.347	29.335	29.335
2	1.622	20.273	49.608	1.622	20.273	49.608
3	1.103	13.782	63.390	1.103	13.782	63.390
4	.978	12.223	75.614			
5	.721	9.007	84.621			
6	.657	8.213	92.833			
7	.349	4.366	97.199			
8	.224	2.801	100.000			

Extraction Method: Principal Component Analysis.

Table 4.6: Component Matrix

	Component		
	1	2	3
Procurement improved service delivery	4.925E-02	.419	-.314
risk management	-.615	.461	.194
sales promotion	-.671	-.300	7.242E-02
remote banking	-7.610E-03	.579	.717
better response to customer demand	-3.197E-02	-.615	.562
better payment	.634	-.506	.199
Sales up scaling	.766	9.321E-02	-.146
	.726	.407	.265

Extraction Method: Principal Component Analysis.

1 Components extracted.

The results in Tables 4.5 and 4.6 above indicate that the use of mobile phones for; procurement, better payment, and risk management constitute mobile banking practices that account for 63.39% of the variation in the operations efficiency of the MSEs at Gikomba market at 29.335%, 20.273%, and 13.782% of the total variation respectively. This is in tandem with the current paradigm shift to paperless transaction by banks and micro-finance institutions in Kenya (CBK, 2014).

4.3.2 Mobile Banking as a Competitive Strategy

The study sought to investigate the extent to which MSEs apply a mobile banking as a competitive operations strategy. Respondents were required to state the extent to which they use mobile banking as a key operations strategy on a likert scale of 1-5 where: 1 = Very large extent; 2= Large extent; 3 = Moderate extent; 4 = Small extent; and 5 = No extent.

Table 4.7 Descriptive Statistics (Mobile banking as a competitive strategy)

	N	Minimum	Maximum	Mean		Std. Deviation	Variance
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
Mobile banking as a strategy	52	1.0	5.0	3.596	.156	1.125	1.265
Valid N (list-wise)	52						

The results in Table 4.7 above indicate most of the MSEs have adopted mobile banking as a competitive strategy to a moderate extent with a mean of 3.596 and a standard deviation of 1.125. This implies that while most MSEs are aware of the benefits of mobile banking, they have not realized the potential of adopting mobile banking as a key competitive strategy in the market. The findings underscore the need for the government and relevant stakeholders to come up with policy instruments that will be geared towards the enhancements of the utilization of mobile banking as a key competitive tool among the MSEs. The findings are consistent with Miguel et al. (2013) who found out that dynamic financial and innovations like mobile banking have been hindered by the complexity and fragility of regulatory principles and policy.

4.3.3 Procurement Efficiency

Mobile technology has helped small business units' scale up their operations since its inception in the late 1990s as evident in past empirical findings which concur that mobile banking

enhances procurement efficiency. The study sought to investigate the extent to which mobile banking has influenced procurement efficiency and how efficient procurement practices enhance operations efficiency of the respective MSEs. The respondents were required to provide information/data regarding: procurement costs; technology leverage; and the ratio of total expenditure of the procurement department to total operations budget of the respective MSEs.

Table 4.8: Descriptive Statistics (procurement efficiency)

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic
Procurement cost as a percentage of total expenditure	52	43.00	4.00	47.00	27.6731	1.7333	12.4990
Technology leverage	52	39.00	9.00	48.00	32.9038	1.3833	9.9750
Ratio of total procurement expenditure to total departmental budget	52	45.00	4.00	49.00	29.0962	1.6942	12.2174

From the findings in Table 4.8 above, the average technology cost as a percentage of procurement cost is the highest procurement efficiency metric with a mean of 32.903 and a standard deviation of 9.9750 followed by the ratio of total expenditure of the procurement department to total operations budget of the MSEs at 29.0962. Procurement cost comes last with a mean of 27.6731. Procurement cost as a percentage of total expenditure has the greatest effect on the operations efficiency of the MSEs with the highest standard deviation at 12.4990. This implies the efficiency of the MSEs can be enhanced by procuring using mobile phones further augmenting the rationale for mobile banking. The findings above imply that mobile banking has been adopted in the procurement process of the MSEs. Each of the procurement functions has a high standard deviation indicating that mobile banking has had a significant influence in the procurement efficiency of the MSEs. The fact that mobile banking has reduced procurement costs as a percentage of total expenditure and the ratio of total procurement expenditure to total

departmental budget implies that mobile banking enhances optimal resource utilization hence procurement efficiency. The findings concur with Boudijilda & Pannetto (2013) who found out that mobile technology fosters procurement leading to information exchange and access to vital information during the procurement process.

4.3.4 Improved Service Delivery

The study sought to assess the extent to which mobile banking leads to improved Service delivery and how ultimately improved service delivery affects the respective MSEs operations efficiency. Improved service delivery was measured by the extent to which mobile banking leads to the reduction in cycle time. Average cycle time to targeted average cycle time % was applied to assess the variable of improved service delivery. The outcome of the descriptive analysis is presented in Table 4.9.

Table 4.9: Descriptive Statistics (Improved service delivery)

	N	Minimum	Maximum	Mean		Std. Deviation	Variance
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
reduction in cycle time %	52	9.00	53.00	29.9231	1.6715	12.0536	145.288
actual throughput %	52	10.00	456.00	38.0000	8.3799	60.4285	3651.608
best observed throughput %	52	3.00	245.00	29.4615	4.5688	32.9459	1085.430

The findings in Table 4.9 above indicate that mobile banking has enhanced service delivery among the MSEs at Gikomba market given the fact that all the metrics for improved service delivery have a mean of over 29.4. Actual throughput as a percentage of the planned throughput has the highest mean at 38 and an equally high standard deviation of 60.42 followed by percentage in reduction in cycle time and best observed throughput at 29.9231 and 29.4615 respectively. The findings above indicates that mobile banking has had a substantial effect on the service delivery of the MSEs as portrayed by the key efficiency metrics for improved service delivery with the actual throughput having the highest mean and standard deviation. It is thus apparent that if the MSEs must remain competitive, they ought to adopt mobile banking and

allied ICT technologies. The findings contradict those of Scarborough and Mulupi (2010) who argue that; the service delivery of MSEs tends to be aligned to the operations strategy of banks and financial institutions in their quest to explore the *Bank Focused Model*.

4.3.5 Paperless Transactions

In the current study, paperless transaction was measured by the percentage reduction in transaction cost as a result of the MSEs's use of mobile banking. The respondents were required to provide information on the percentage reduction in transaction costs for a period of five years.

Table 4.10: Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
2009	52	39.00	1.00	40.00	13.1538	1.2711	84.015
2010	52	38.00	2.00	40.00	12.6731	1.2076	75.832
2011	52	43.00	2.00	45.00	18.9423	1.5177	119.781
2012	52	39.00	1.00	40.00	12.3462	1.3006	87.956
2013	52	38.00	2.00	40.00	13.3077	1.2104	76.178

According to the findings in Table 4.10 above, the mean ratio of transaction cost reduction was over 10 for the period 2009-2013. This implies that paperless transactions have reduced the transaction cost of the MSEs leading to cost efficiency and ultimately enhancing their competitiveness. The findings complements that of Gordon and Pallister (2010) who found that that M-pesa allows paperless transactions making it the most preferred and dominant money transfer service in Kenya and it has huge impact in the number and average amount of person to person money transfer. It also has a significant economic impact to many low to medium income Kenyans due to the fact that it is mostly paperless. In the same vein, the results above concur with Nderitu (2010) who conducted a random survey of M-pesa users and found out that M-pesa allows paperless transactions making it the most preferred and dominant money transfer service in Kenya and it has huge impact in the number and average amount of person to person money transfer.

4.3.6 Business Risk Management

The study sought to examine the effect of risk management on efficiency among MSEs at Gikomba market. Risk was measured by calculating the variance and standard deviation of the expected returns.

Table 4.11: Descriptive Statistics

	N	Minimum	Maximum	Mean		Std. Deviation	Variance
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
Expected returns	52	2.50000	25.00000	11.0096154	.6138132	4.4262700	19.592
Valid N (list-wise)	52						

From Table 4.11 most of the MSEs at Gikombamarket has reduced risk by adopting mobile banking with a mean of 11.009 and standard deviation of 4.426. This implies that mobile banking through risk management accounts for a significant variation in the operations efficiency of the MSEs.

4.3.7 Operations Efficiency of the MSEs

Several efficiency indicators are used to determine the operation efficiency of an enterprise. The study focused on the following efficiency metrics: Ratio of actual throughput to best observed throughput %; Transaction Cost reduction %; Reduction in cycle time %; Line items on back Order to total line items %; Average cycle time to targeted average cycle time %; Rejects early or late delivery to total number of items delivered %; and Total expenditure of the procurement department to total budget of the MSEs %.

The average OPEX (Operations Expenditure) of the MSEs was calculated as indicated in Table 4.12.

Table 4.12 Average OPEX

SME	2009	2010	2011	2012	2013	OPEX
	X1	X2	X3	X4	X5	
F1	20	38.6	30	39.8	45.12	34.704
F2	30	20	68.6	45.3	54.1	43.6
F3	12	65.7	20	77.6	26.8	40.42
F4	30	25	45.1	74.2	56.2	46.1
F5	20	33.1	8	10	55.2	25.26
F6	20	28	12	30	66.2	31.24
F7	33.5	30	36.5	41.2	48.2	37.88
F8	5	12	25.7	10	88.1	28.16
F9	6	74.2	78.2	74.2	35.9	53.7

F10	11.3	83.5	74.2	51.2	66.2	57.28
F11	49.8	10	56.2	69.5	78.2	52.74
F12	12	9	5	65.1	65.7	31.36
F13	66.2	33.1	25.8	75.2	33.2	46.7
F14	30	56.2	75.4	69.5	32.5	52.72
F15	10	11	9	75.2	45.1	30.06
F16	44.5	62.8	62.8	77.6	33.2	56.18
F17	12	12	26.1	62.8	28.5	28.28
F18	22.8	62.8	10	83.5	28.2	41.46
F19	18.6	10	75.4	15	65.2	36.84
F20	18	24	12	74.2	10	27.64
F21	13	51.2	83.5	33.5	53.1	46.86
F22	13	42.3	81.2	10	24	34.1
F23	29.6	12	77.6	51.2	66.4	47.36
F24	44.9	28.2	10	12	25.9	24.2
F25	23.7	13	74.2	51.2	20.2	36.46
F26	33.5	66.2	10	75.2	38.2	44.62
F27	66.9	13	22.1	10	40.1	30.42
F28	25.9	41.2	25.4	13.2	83.5	37.84
F29	11.9	74.2	77.8	51.2	62.8	55.58
F30	10	75.4	67.8	51.2	66.8	54.24
F31	27.2	77.6	69.5	41.2	54.1	53.92
F32	8	10	68.7	23	12	24.34
F33	12.3	72.8	41	68.7	33.2	45.6
F34	65.2	12	19.8	10	15	24.4
F35	54.8	16	75.4	83.5	37.7	53.48
F36	42.6	74.2	83.5	51.2	28.4	55.98
F37	22.9	62.8	68.7	75.2	33.1	52.54
F38	30	8	16	14	61.9	25.98
F39	44.9	28.2	69.5	83.5	25.9	50.4
F40	23.7	83.5	74.2	51.2	20.2	50.56
F41	33.5	66.2	12.5	13.8	10.8	27.36
F42	23	24	22.1	10	15	18.82
F43	56.7	41.2	83.5	62.8	83.5	65.54
F44	11.9	10	10	51.2	12	19.02
F45	20	9	67.8	51.2	66.8	42.96
F46	27.2	10	25	41.2	54.1	31.5
F47	16	25	36	10	78.2	33.04
F48	10	58.5	10	65.1	65.7	41.86
F49	18	33.1	25.8	75.2	33.2	37.06
F50	45.9	83.5	12	25	35	40.28
F51	10	33.1	14	47.1	55.2	31.88
F52	13	75.1	12	13	50	32.62

Results in Table 4.12 above indicate the Average Operations Expenditure of MSEs over the period (2009-2013).

4.4 The relationship Between Mobile Banking and Efficiency

There exists a near perfect correlation between mobile banking and technology awareness which ultimately positively correlates with operations efficiency particularly among MSEs in Kenya (Aduka, 2010). Riding on this premise, the current study sought to establish the relationship between mobile banking and the operations efficiency of MSEs at Gikomba market. To establish the relationship between mobile banking and operations efficiency among the MSEs at Gikomba market a multiple regression analysis was done using SPSS version 22 statistical package. The independent variables included: procurement efficiency, improved service delivery, paperless transactions, and risk management. The dependent variable was the operations efficiency of the MSEs. The operation expenditure indices for the MSEs indicated in Table 4.12 above were used as the dependent variable in the regression analysis.

The resulting regression coefficients have been used to interpret the direction and magnitude of the relationship. The β coefficients show the responsiveness of the dependent variable as a result of unit change in each of the independent variables (mobile banking practices). The error term ϵ captures the variations that cannot be explained by the model.

Table 4.13: Model Summary of the effect of mobile banking on MSEs' efficiency

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change in R Square	F Change	df1	df2	Sig. F Change
1	.280	.78	.000	11.5120	.78	.998	4	47	.001
a) Predictors: (Constant), risk management, paperless transactions, improved service delivery, procurement efficiency.									
b) Dependent variable: Operations efficiency									

Table 4.14: ANOVA of the effect of mobile banking on MSEs efficiency

Model	Sum of	df	Mean	F	Sig.
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		Squares		Square			
1	Regression	528.857	4	132.214	.998	.001	
	Residual	6228.731	47	132.526			
Total		6757.588	51				

- a) Predictors: (Constant), risk management, paperless transactions, improved service delivery, procurement efficiency
b) Dependent Variable: Operations efficiency

From Table 4.13 above, the Coefficient of Multiple Determination (R^2) is 0.78 which implies that the model is of high 'goodness of fit'. Results in Table 4.14 indicate that the F static was 0.998 with a significant change of 0.001%. This implies that the impact of mobile banking practices on the efficiency of the MSEs is significant at 5% confidence level.

Table 4.15: Model Coefficients of the effect of mobile banking on MSEs' efficiency

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Correlations Zero-order
		B	Std. Error	Beta			Lower Bound	Upper Bound	
1	(Constant)	28.490	10.473		2.720	.009	7.421	49.560	
	procurement efficiency	.110	.309	.053	.357	.002	-.511	.731	-.040
	improved service delivery	.166	.226	.108	.736	.002	.620	.288	.076
	paperless transactions	.878	.462	.277	1.900	.001	.052	1.808	.255
	risk management	.815	.323	.039	.273	.002	.561	.737	.044

- a) Dependent Variable: Operations efficiency

According to the results in Table 4.15 above, the most influential mobile banking effect is paperless transactions with a regression coefficient of 0.878 and a P- value of 0.001. Risk management with a correlation coefficient of 0.815 and a P-value of 0.001 follows. Next is improved service delivery with a correlation coefficient of 0.166 and P-Value of 0.002. Procurement efficiency has the least impact with a correlation coefficient of 0.110 and P-value of 0.002.

As per the SPSS generated results shown in Table 4.15, the regression model

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 \text{ becomes;}$$

$$Y = 28.490 + 0.110X_1 + 0.166X_2 + 0.878X_3 + 0.815X_4$$

According to the regression equation established above, taking all the independent variables at zero, the operations efficiency of the MSEs will be 28.49. The data findings analyzed also shows that holding all other independent variables constant, a unit increase in the MSEs's procurement efficiency, will lead to a 0.11 increase in the operations efficiency of the MSEs.

On the other hand keeping all other variables constant, a unit increase in improved service delivery will lead to an increase of 0.166 in the operations efficiency of the MSEs while a unit increase in paperless transaction will lead to a 0.878 increase in the operations efficiency of the MSEs. Holding other independent variables constant, a unit increase in risk management will lead to a 0.815 increase in the operations efficiency of the MSEs.

The findings above support Aduka (2010) who carried out studies on; the effect of mobile banking on selected macroeconomic factors in Kenya and found out that with increased improvement and awareness of technology so did the customers registered for mobile banking increased and that mobile banking is positively correlated operations efficiency particularly among the MSEs .

The findings however contradict Dione (2013) who found out that; though mobile banking is ultimately used by retail traders, the institutions that implement mobile banking strategies have a role to play in ensuring their final success. Notwithstanding the significant benefits of mobile banking and its capabilities, its risks and challenges are recognized and need to be managed by banking institutions in a prudent and professional manner. In the same grain, Katrin (2011) differs by concluding that the level of security or risk associated with adoption of mobile banking is a major factor affecting the acceptance and adoption of the mobile banking products.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The study sought to determine; the effect of mobile banking on the efficiency of MSEs. This chapter presents; the summary of the findings, conclusions and recommendations of the study.

5.2 Summary of the Findings

The outcome of the study revealed that technological changes in the external environment of the MSEs affect their competitiveness. In this context MSEs at Gikomba market have embraced mobile banking to remain competitive by enhancing their efficiency and mitigating their operations risks.

The first objective of the study was to examine the effect of procurement efficiency on the operational efficiency of MSEs at Gikomba market. The outcome of the analysis indicated that the MSEs have enhanced their procurement efficiency by adopting mobile banking and ultimately leading to increased operations efficiency among the MSEs. A unit increase in procurement efficiency will lead to a 0.11 increase in the efficiency of the MSEs.

The second objective was to investigate the influence of improved service on operational efficiency of MSEs at Gikomba market. The outcome of the analysis indicated that mobile banking has enhanced the MSEs's service provision by making them more agile and responsive to customer demand. This is evident by the fact that a unit increase in improved service will lead to a 0.166 increase in the efficiency of the MSEs at Gikomba market.

The third objective was to assess the effect of paperless transactions on the operational efficiency of MSEs at Gikomba market. The outcome of the analysis indicated that paperless transactions have a significant influence on the efficiency of the MSEs. Going by the findings a unit increase in paperless transactions will lead to a 0.878 increase in the efficiency of the MSEs.

The fourth objective was to examine the effect of risk management on operational efficiency among MSEs at Gikomba market. The results of the analysis indicated that mobile banking has

enabled MSEs mitigate risks and ultimately enhance their efficiency with a unit increase in risk management leading to a 0.815 increase in the efficiency of the MSEs.

5.3 Conclusion

As a new technology application, mobile banking is used as a banking and financial service at Gikomba market. The study reveals that most of the MSEs in Gikomba market have embraced mobile banking. According to the study, procurement efficiency, improved service delivery, paperless transactions, and risk management have significantly affected the operations efficiency of the MSEs at Gikomba market as supported by the outcome of the regression analysis indicating a high Coefficient of Multiple Determination. The results of this study also address some of the existing knowledge gaps and thus contribute to the frontiers of knowledge. First, the study has not only advanced an elaborate conceptual framework of mobile banking and operations efficiency but has also empirically tested it. The findings of the study indicate that effective mobile banking practices not only contribute to improved operations efficiency, but also enhance the organizational competitiveness of MSEs. The results are found to be consistent with previous studies except improved service delivery which was found to be important in influencing the operations efficiency of MSEs at Gikomba market.

5.4 Managerial and Theoretical Implications

A better understanding of mobile banking has in the recent past been a key area for banking practitioners and researchers. Hence, the results of this study have significant managerial and academic contributions. First and foremost, the study gives MSEs proprietors and bank managers some insights on how to effectively build their mobile banking strategy and leverage on their organizational factors to enhance the influence of mobile banking on operations efficiency of their organizations.

The results of the study contribute to the body of knowledge in the area by demonstrating that context specific factors such as service quality and service awareness are influencing user perceptions about the usefulness of mobile banking which in turn affect intention to use and adoption. Consequently exploring the factors influencing the use or adoption of mobile banking is quite important for MSEs and banks that may need to improve and validate their services in order to satisfy more customers and make more profit.

The study found that 37% of the MSEs are yet to embrace mobile banking. Thus there is need for the government and relevant authorities to provide impetus for more MSEs embrace mobile banking and tap the technological economies associated with mobile banking. The fact that most of the mobile banking practices have a near perfect positive influence on the operations efficiency of MSEs underscores the need for the MSEs to increase investment in technology and particularly mobile banking.

The study thus makes significant contribution across the area of MSEs adoption of mobile banking with the following key contributions: the development of a conceptual model that explains and predicts how mobile banking practices affect the operations efficiency of MSEs; the empirical support for proposed research questions based on integrative research framework and literature; and the potential to be generalized to nation-wide adoption of mobile banking among MSEs.

5.5 Limitations of the Study

The study sought to establish the relationship between mobile banking undertaken by the MSEs at Gikomba and their efficiency. It is clear that a study of this magnitude should include a survey of sizeable number of MSEs. However time and material resources did not make this feasible and for this reason the study concentrated on just 63 of the MSEs at Gikomba market.

The study fails to appreciate the fact that mobile banking is relatively new in Kenya particularly in the informal sector as indicated by the researcher's inability to measure the actual usage behavior of such services and allied technology.

Despite the limitations discussed above, it is hoped that the practical recommendations to the MSEs & banking industry will be found useful, and that the research approach can be applied to the study of other mobile services, in a range of contexts and environments. In the same strength, it is hoped that the validity of the findings emanating from this study cannot be compromised.

5.6 Suggestions for Further Research

The limitations and implications discussed point at some areas for further study and research. Studies involving confirmatory factor analysis will need to be carried out to further test the

model so established and to confirm the findings of the study. Additional research , both longitudinal and cross sectional, is needed to examine the differences of this frame work as users evolving from being aware of mobile banking, to having experience with mobile banking, to being continued use of mobile banking. At the same time, further studies can be conducted to test and confirm the factor loadings in different MSEs so as to establish the validity and strength of the model.

More research with alternative conceptualization of mobile banking would be useful in more understanding the role of trust in the initial adoption of mobile banking. Therefore further research considering these factors could enhance the understanding of acceptance of mobile banking by MSEs.

In a comparison between MSEs operating in different settings form Gikomba market, the differences and similarities could be identified in terms of factors influencing the use or adoption of mobile banking. Since this study is concerned with mobile banking adoption among the MSEs at Gikomba market, other factors may be added to the model. For instance comparison can be made between individual MSEs and other mobile banking users in terms of the factors influencing their adoption decisions.

REFERENCES

Adrian, D. & Njenga, K. (2012). The Successive Use of Information and Communication Technologies at in banking. *Unpublished research project, University of Texas.*

doi:10.1111/j.1468 2885.2007.00308.x

Aduka, X. (2010). Factors affecting the Adoption of Mobile Banking Services, *Journal of*

Internet Banking and Commerce (JIBC). Retrieved November 28,2008, from
<http://www.arraydev.com/commerce/jibc/0306-04.htm>

Agarwal, R., & Prasad, J. (1998). A conceptual and operational definition of personal Innovativeness in the domain of information technology. *Information Systems Research*, 9(2), 204-301.

Angulove, V.;Rick, D.; & Teddy, H. (2008). *Rethinking Production*, 2008, State of the World: Innovations for a Sustainable Economy, Worldwatch Institute, New York

Anong, T. and Irina, K. (2013). M-finance and consumer redress for the unbanked in South Africa, *International Journal of Consumer Studies*, 37(4), 453-464. DOI: 10.1111/ijcs.12014

Baraka, R. and Sengo, K. (2013). Growth of Mobile Banking in Kenya. *International Journal of Strategic management*. 14(5) 302-398. Doi: 33200lk.110110kl

Bartram, M. and Areztez, K. (2010). Corporate Hedging and shareholder Value. *Journal of Financial Research*, 33(4), 317-371. DOI: 10.1111/j.1475-6803.2010.01278.x

Bates, A. &Immergluck, F. (2012). The Determinants of Enterprise Growth in Sub-Saharan Africa: Evidence from the Regional program on Enterprise Development, *RPED Discussion Paper*, the World Bank.

Batung, Y.; Owen, E. & John, G. (2006). The adoption of Internet financial services: a qualitative Study. *International Journal of Retail & distribution Management*, 20(8), 390-398.

Bedman, N. and Kuada, J. (2014). Customer Satisfaction with Retail Banking Services in Ghana. *Thunderbird International Business Review*, 56(4), 535-371. DOI: 10.1002/tie.21626

Beer, F. (1973). Dynamic Financial Systems: Complexity, fragility and regulatory principles.

Bollen J. (1989). Does item homogeneity indicate internal consistency or item redundancy in psychometric scales? *Personality*

Bongsikh, S.; Lee, H.; and Kim, G. (2009). Understanding dynamics between initial trust and Usage intentions of mobile banking. *Information Systems Journal*, 19(3), 283-311. DOI: 10.1111/j.1365-2575.2007.00269.x

Boudijilda, N. & Pannetto, H. (2013). The European Public Procurement Initiative and Standards for Information Exchange. *Journal of Management Science*, 7(2), 651-874. DOI: 10.1002/9781118558003.ch7

Cater, B. (2014): "Firm Size Effects on Transaction Costs", *Small Business Economics*, Vol: 5, No.: 4

CBK (2014). *Annual report*

Ciemleja, G. and Nataljia, L. (2011). The Model of Sustainable Performance of Small and Medium-sized Enterprise. *Journal of Engineering Economics*, 4(1), 451-568.
doi.org/10.5755/j01.ee.22.5.968

Clement, D. (2007). Protecting personal information online: a survey of user privacy concerns and control techniques. *Journal of Computer Information Systems*, XLIV (2), 85-100.

Coleman, G. (2008). Integrated Financial Management Information Systems: Guidelines for Effective implementation by the public sector of South Africa. *AOSIS Open Journals*, 4(3), 443-778. Doi: 2200k.345jx

Collins, M.; Lacuna, J. and Ruefli, W. (1999). Risk Measures in strategic Management. *Strategic Management Journal*, 20(2), 188-365. DOI: 10.1002/(SICI)1097-0266(199902)20:2<167::AID-

Comminus, T. (2008). Interactive Process Models for mobile application systems: A framework. In *Proceedings of the 23rd International Conference on Information system*, Barcelona, Spain, 15-18 December, pp. 401-413.

Cook, N. & Campbell, 1979). *Statistical methods* (8th ed.). Ames: Iowa State University Press.

- Cracknell, Z. (2004). The impact of mobile telephone use on economic development of households in Uganda. *RePub*). Erasmus University , <<http://repub.eur.nl/res/pub/26793/2011-1524.pdf>>.
- Cronbach, L. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16(3), 297-334. doi: 10.1007/BF02310555
- Dione, G. (2013). Risk Management History, Definition and Critique. *International Insolvency Review*, 16(2), 147-166. DOI: 11.1111/rmir.12014
- Drost, E. (2009). Validity and Reliability in Social Science Research. *Education Research and Perspectives*, 38(1) 105 – 118.
- Gordon, R. and Pallister, G. (2010). Explaining Internet Banking Behavior: Theory of Reasoned Action, Theory of Planned Behavior, or Technology Acceptance Model? *Journal of Applied Social Psychology*, 40(5), 1172-1202. DOI: 10.1111/j.1559-1816.2010.00615.x
- Graham, J. (2009). Bringing ICT to the Strategy Table. *Unpublished project, Australian School of Business*. DOI: 10.1002/jsc.1894
- Hughes, O. & Lonie, P. (2007). E-commerce as socio-technical change. *Finance and Investments*, 14(5), 78-135. DOI: 10.1002/jsc.728
- Ivstry, G. Porteous, T; and Mark Pickens (2006). Mobile Phone Banking and Low-Income

Customers: Evidence from South Africa.” Consultative Group to Assist the Poor. Consultative Group to Assist the Poor, 2006. Web. 6 Nov. 2011. <<http://www.cgap.org/gm/document-1.9.2953/mobilephonebanking.pdf>>.

Jack, D.; Suri, A. & Kuria, P. (2010). Mobile technology uptake in Kenya. *International Journal of Managing Projects in Business*, 5(8), 250-453

Jack P. (2009). Chinese Public Finance Frame work. *Annals of Public and Cooperative Economics*, 85(4), 87-102. DOI: 10.1111/apce.12031

Jones, A. & Bamford, B. (2004). The other face of research governance *British Medical Journal* 329: 280-281.

Kaestner, H. & Servon, P. (2008). Mapping the reasons for resistance to Internet banking: a means-end approach. *International Journal of Information Management*, 27(2).

Kangogo, V. (2013). (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science*, 35(8), 982–1003.

Karjaluoto, H. (2002). Factors underlying attitude formation towards online banking in Finland. *International Journal of Banking Marketing*, 20 (6), 261-272.

Kathelijjn, P. (2011). The Relationship between Firm Dividend Policy and Expected

Earnings Growth. *International Journal of Managing Projects in Business*, 3(2), - 256. Doi: 10.1108/17538371011036563.

Katrin, A. (2011). Financial Risk Management in SMEs: The use of financial analysis for Identifying and monitoring internal financial risks. *Journal of Accounting Research*, 2(6), 231-258. Doi: 00.2108/09526860510588179/ xj

Keli, K. (2012). Factors affecting adoption of mobile phone banking by customers of Commercial banks in Kenya. *Unpublished MBAproject, University of Nairobi.*

Kim, S. & Bongshik, L. (2009). The Basic Public finance of Public private partnership. *Journal of European Economic association*, 11(1), 83-111. DOI: 10.1111/j.1542-4774.2012.01105.x

Kio, A. (2011). The extent of mobile commerce adoption in Kenya. *Unpublished MBAproject, University of Nairobi.*

Klingebiel, T.; Thomas, G. and Stign, C. (2002). E-Finance in Emerging Markets: Is Leapfrogging Possible? *Financial markets, institutions & instruments*, 11(1), 1-125. DOI: 10.1111/1468 0416.00001

Kombo, T. & Tromp. *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum

Kothari, C.R & Carg, G. (2014). *Research methodology: methods and techniques*. New Delhi: New Age International

Kuria (2009). Mobile Money: Implications for Emerging Markets. *Communications and Strategies* 79 (2010): 15-28. *Social Science Research Network*. Web. 7 Nov. 2011. <<http://ssrn.com/abstract=1810585>>.

Macknon, Y. (2011). Towards a method for business process and informal business rules Compliance. *Journal of Software: Evolution & process*, 24(30), 341-360. DOI: 10.1002/smr.553

Mas, I. & Radcliffe, N. (2010). Segmenting Bank Customers by Resistance to Mobile Banking. The Sixth International Conference on the Management of Mobile Business (ICMB 2007). IEEE.

Maurer, K. (2008). Consumer value creation in mobile banking services. *International Journal of Mobile Communications*, 3(4), 325- 338.

Merlens, N. (1998). Customer Dissatisfaction; the Relationship between Types of Problems and Customer Response. *Canadian Journal of Administrative Sciences*, Vol. 13, no. 3, pp. 264-76.

Miguel, P.; Stoll, R. and Hans, R. (2013). Dynamic Financial System: Complexity, Fragility and Regulatory Principles. *Financial Markets, Institutions & Instruments*, 26(1), 1-42. : 10.1111/fmii.13002

Morawczynski (2009). The adoption of electronic banking technologies by American consumers,

Consumer Interests Annual, 47, 1-9.

Mugenda, M. (2003) *Research Methods*: Acts Press, Nairobi.

Mulupi, F. (2010): Firm Size Effects on Transaction Costs, *Small Business Economics*,
Vol: 5, No.: 4

Narteh, A. & Kuada, L. (2014). The Structure of Cross-Sector Financial Supervision.
Journal of International finance, 6(3), 344-567. Doi: 10056.jg.453j.

Nderitu, W. (2010). Assessing the impact of mobile & electronic banking on financial risk
Management in Kenya. *Unpublished MBA project, University of Nairobi.*

Ndungu, D. (2013). Cell phone banking: predictors of adoption in South Africa- an exploratory
study. *International Journal of Information Management*, 23(5), 381-394.

Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). New York, NY: McGraw-Hill.

Nunnally, J. C., & Bernstein, I. H. (1994) *Psychometric theory* (3rd ed.). New York, NY:
McGraw-Hill, Inc.

Ojanji, N. (2013). The effect of mobile money uptake on financial performance of non-
Governmental organizations in Kenya. *Unpublished MBAproject, University of Nairobi.*

Porta, R. (2008). *On landmark selection and sampling in high dimensional data analysis.*

ArXiv: 0906.4582v1 [stat.ML], 2009.

Porteuos, F. (2006). Corporate Risk management under Information Asymmetry. *Journal of Business Finance & Accounting*, 40(1), 239-279. DOI: 10.1111/jbfa.12008

Prasad, J. and Agarwal, R. (2009). *The Role of Innovation Characteristics and Perceived Voluntariness in the Acceptance of Information Technologies*. *Decision Science*, 28(3), 557-582

Rahaman, G. (2012): *Investment under Uncertainty*, Princeton University Press, Princeton

Rjaseker, D. (2013). M-Commerce: why does it not fly (yet?). *Proceedings of the SSGRR 2002s Conference on advances in Infrastructure for e-business, e-education, e-science and e-medicine on the internet*, LAquila, Italy, 29 July August.

Roettgers, T. (2009). Implementing Technologies for Financial Service Innovations in Base of the Pyramid Markets. *Journal of Production innovation*, 30(6), 1199-1211. DOI: 10.1111/jpim.12054

RoK (2014). *Economic review*, pp 354-364

RoK (2012). *Economic review*, pp 610-786

Ronald, S. (2012). Applying the technology acceptance model and flow theory to online Consumer behavior. *Information Systems Research*, 13(2), 205–223

Rosenthal, R.;Rosnow, R, & Rubin, D.B. (2000). *Contrasts and effect sizes in behavioral research: A correlational approach*. New York: Cambridge University Press.

Rosnow, R. & Rosenthal, L. (1991). *Essentials of behavioral research: Methods and data analysis* (2nd ed.). New York: McGraw-Hil.

Ross, E. & smith, W. (2006). Small Business Uniqueness and the Theory of Financial Management, *The Journal of Small Business Finance*, 1(1), pp: 1-13

Saunders, L; Manion, L.; Fred, T & Pong, T. (2002). *Research Methods in Education* (5th Ed).London:RoutledgeFalmer.

Scarborough, T. and Mulupi, H. (2010). Exploring the Bank Focused Model. *International Journal of Management*, 3(1), 587-601. Doi: 12111k.10053js

Sloan, M. & Suri, A. (2010). ICT and operational efficiency among SMEs in Kenya. *Tijdch-rift voorEconomie en Management*, 49(2), pp. 271-308

Sloan, M. &Tavneet, K.(2010). The Implementation of Integrated Financial Information Management Systems (IFMIS), *Transparency International*, 2(1), 23-79. Doi: 1110g.jk5557x

Snidjerst, F.L. &Bosker, K. (2000). Statistical significance testing and cumulative knowledge in Psychology: Implications for training of researchers. *Psychological Methods*, 1, 115–129.

Thegeya, P. & Demomobynes, L. (2010). Implementing Technologies for Financial Service Innovations in Base of the Pyramid Markets. *Journal of Production innovation*, 30(6), 1199-1211. DOI: 10.1111/jpim.12054

Tolbert, S. & Zuker X. (2003). Consumers' attitudes towards online and mobile banking in China. *International Journal of Bank Marketing*, vol. 23, no. 5, pp. 362-380.

Viswanath, D.; Shuk, H.; and Kwo, C. (2003). Consumer value creation in mobile banking services. *International Journal of Mobile Communications*, 3(4), 325- 338.

Wright, Z.; Ben, E.; Saloni, T. & Kim, N. (2006). Extending the Technology Acceptance Model: The Influence of Perceived User Resources. *DATA BASE for Advances in Information Systems*, 32(3), 86-112.

Zuker, B. (2013). Predicting e-services adoption: a perceived risk facets perspective. *A Paper presented at the English Americas Conference on Information Systems, Dallas, Texas.*

APPENDIX I: THE QUESTIONNAIRE

SECTION A: DEMOGRAPHIC INFORMATION

1. Gender:

Male () Female ()

3. What is your highest academic qualification achieved?

Diploma () Degree () Masters ()

others (please specify.....)

4. What is your current designation

5. For how many years have been working in this market?

1 – 5 years () 6 – 10 years () 11 – 15 years ()

16 – 20 years () 21 years and above ()

SECTION B: MOBILE BANKING

6. Do you understand what Mobile Banking is?

Yes: () No: ()

7. If the answer above is No how do you undertake your banking functions?

.....

8. To what extent does your business use mobile banking in the following key functional areas? Use a scale of 1 to 5 where 1 is to a very large extent and 5 is to no extent.

Application of Mobile Banking in key functional areas	1	2	3	4	5
Procurement					

Improved service delivery					
Risk management					
Sales Promotions					
Remote Banking					
Others specify					

9. Please indicate the extent to which paperless transaction through mobile banking has reduced transaction cost.

To a very large extent ()

To large extent ()

To moderate extent ()

To a small extent ()

To no extent ()

11. Please provide the following information regarding procurement efficiency in your Enterprise.

Metric	Description	2009	2010	2011	2012	2013
Cost	Procurement cost as a percentage of total expenditure					
Technology leverage	Technology cost as a percentage of procurement cost					
Cycle time	hours required to complete a requisition					

12. Please provide the following information regarding service delivery in your enterprise.

Metric	Description	2009	2010	2011	2012	2013
Actual throughput	Actual output					
Best observed throughput	Potential output					

SECTION C: MOBILE BANKING & RISK MONITORING

13. How does your business monitor risk?

.....

14. What are some of the main challenges facing risk monitoring in your business?

.....

15. To what extent does mobile banking mitigate risk in your business?

To a very large extent ()

To large extent ()

To moderate extent ()

To a small extent ()

To no extent ()

SECTION D: BENEFITS OF MOBILE BANKING

16. The justification for Mobile Banking is made from a number of perspectives.

Use a scale of 1 to 5 where 1 is to a great extent and 5 is to no extent.

Benefits of Mobile Banking	1	2	3	4	5
Increased profitability through sales up scaling					

Better response to customer demand					
Payment efficiency					
Reduced Risks					
Efficient procurement					
Remote banking					

SECTION F: MOBILE BANKING AND EFFICIENCY

17. To what extent do you think the application of Mobile banking has increased the Profitability of your business over the last five years?

To a very large extent ()

To large extent ()

To moderate extent ()

To a small extent ()

To no extent ()

18. Please provide us with the following information regarding the operations efficiency of your business for the last five years.

Measures of Operations Efficiency	2009	2010	2011	2012	2013
Ratio of actual throughput to best observed throughput %					
Transaction Cost reduction %					
Reduction in cycle time %					
Line items on back Order to total line items %					
Average cycle time to targeted average cycle time %					

Rejects early or late delivery to total number of items delivered %					
Total expenditure of the procurement department to total budget of the SMEs %					

19. Please provide us with the following financial information

Description	2014
Current Assets	
Current Liabilities	
Profit after Tax	
Total Assets	
Interest	

APPENDIX II: CORRELATION ANALYSIS

		operations efficiency	procurement efficiency	improved service delivery	paperless transactions	risk management
Pearson	operations	1.000	-.040	-.076	.255	.044

Correlation		efficiency	procurement	improved service delivery	paperless transactions	risk management
Sig. (1-tailed)	procurement efficiency	-.040	1.000	.226	-.235	-.109
	improved service delivery	-.076	.226	1.000	.088	-.132
	paperless transactions	.255	-.235	.088	1.000	-.011
	risk management	.044	-.109	-.132	-.011	1.000
	operations efficiency	.	.388	.295	.034	.378
	procurement efficiency	.388	.	.053	.047	.221
	improved service delivery	.295	.053	.	.268	.175
	paperless transactions	.034	.047	.268	.	.471
N	risk management	.378	.221	.175	.471	.
	operations efficiency	52	52	52	52	52
	procurement efficiency	52	52	52	52	52
	improved service delivery	52	52	52	52	52
	paperless transactions	52	52	52	52	52
risk management	52	52	52	52	52	

Coefficients correlations

Model		risk management	paperless transactions	improved service delivery	procurement efficiency
1	Correlations	1.000	.021	.107	.085
	risk management				
	paperless transactions	.021	1.000	-.146	.264
	improved service delivery	.107	-.146	1.000	-.244
	procurement efficiency	.085	.264	-.244	1.000
	Covariances				
	risk management	.104	3.174E-03	7.777E-03	8.439E-03
	paperless transactions	3.174E-03	.213	-1.519E-02	3.761E-02
	improved service delivery	7.777E-03	-1.519E-02	5.093E-02	-1.697E-02
	procurement efficiency	8.439E-03	3.761E-02	-1.697E-02	9.530E-02

Collinearity Diagnostics

a Dependent Variable: operations efficiency

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions	(Constant)	procurement efficiency	improved service delivery	paperless transactions	risk management

1	1	4.658	1.000	.00	.00	.00	.00	.00
	2	.147	5.620	.00	.16	.18	.02	.37
	3	.105	6.663	.00	.43	.20	.16	.10
	4	7.207E-02	8.039	.01	.09	.58	.30	.28
	5	1.767E-02	16.237	.99	.31	.04	.53	.24

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