

**MOBILE MONEY SERVICES USAGE AND OPERATIONAL  
EFFICIENCY OF COMMERCIAL BANKS IN KENYA**

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PARTIAL FULFILLMENT FOR THE AWARD OF DEGREE OF  
MASTER OF BUSINESS ADMINISTRATION IN THE  
UNIVERSITY OF NAIROBI**

**AUGUST 2018**

## **DECLARATION**

This Research Proposal is my original work and has not been submitted for award of a degree at the University of Nairobi or any other University.

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This Proposal has been submitted for examination with my approval as University Supervisors.

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Finally the almighty God for his mercies each day.

## **DEDICATION**

To my daughter Natalie N Kyende.

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## **LIST OF ABBREVIATIONS**

<b>CBA</b>	Commercial Bank Of Africa
<b>CBK</b>	Central Bank Of Kenya
<b>GDP</b>	Gross Domestic Product
<b>GSMA</b>	Global System For Mobile Communications Association
<b>MFBS</b>	Microfinance Banks
<b>MFS</b>	Mobile Financial Services
<b>MNO</b>	Mobile Network Operators
<b>MMS</b>	Mobile Money Services
<b>MRPS</b>	Money Remittance Providers
<b>NPS</b>	National Payment System
<b>ROA</b>	Return On Assets
<b>SME</b>	Small-To-Medium Enterprise
<b>TCE</b>	Transactional Cost Economics
<b>UTAUT</b>	Unified Theory Of Acceptance And Use Of Technology

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## **ABSTRACT**

The use of mobile money services has taken root in the country and as at now it is being popularized by commercial banks who want to have a paradigm shift from the traditional banking practices to branchless forms of banking. Technological advancements have assisted these financial institutions to be able to carry out this form of banking practices. This has also been hastened by the stiff competition within the banking industry due to the interest capping law and other factors. The objective of this study is to determine the usage of mobile money services and operational efficiency of commercial banks in Kenya. The research reviews theories such as the Transactional cost economics, the diffusion of innovation and the Unified Theory of Acceptance and Use of Technology (UTAUT). A population of survey of 43 banks was studied and 36 out of the total 43 commercial banks in Kenya provided all the data that was required. Data analysis was done using SPSS inferential statistics and descriptive statistics was done to establish the relationship between mobile money and operational efficiency. It was found out that the usage of mobile money services had a positive effect on the operational efficiency of commercial banks.

# CHAPTER ONE: INTRODUCTION

## 1.1 Background of the Study

Mobile money is on the edge of transformation from a service used by the technical experts to a service for the mass market (Kimotho, 2013). “Mobile money as a form of cash delivery is viewed by enterprises as an affordable means of money transfer that can be used anywhere and at any time” (Anurag, Tyagi & Raddi, 2009). Mobile money is being used world over by a number of institutions in different sectors some of which are financial services providers like banks who are deliberating on ways to give customers access to their accounts through mobile devices in order to bring banking services closer to them. Banks therefore, ought to regard this emergent technology as a potential catalyst that is capable of increasing their operational efficiencies. Since the pre-colonial days when the financial journey in Kenya started, banks have spread throughout the country and made impact on the financial fronts (CBK, 2017). They have however through substantial metamorphosis changed the landscape of banking this has been achieved through deliberate attempts to reduce costs and increase revenues by increasing efficiency Mbogo (2010).

In Kenya competition has made financial institutions strive to be on the cutting edge by innovating products and services that have made banking more easier for instance when transmitting money the use of mobile can make it possible for bank clients to transact from their bank accounts, send money to pay for utilities for instance water, electricity, and even access a number of financial services provided at a banking hall. The intention of this study is to establish the use of mobile money services and operational efficiency of banks the researcher will achieve this objective by analyzing data posted by commercial banks and Central Bank of Kenya (CBK), the bank regulating authority.

### **1.1.1 Mobile Money**

The term mobile money refers to a service whereby people use mobile phones to transfer money electronically (Senso & Venkatakrishana, 2013) whereas mobile banking has been defined as the use of a mobile telecommunication networks as a platform to perform traditional banking activities (Paul & Henry 2013). The two terms mobile money and mobile banking are therefore different. Africa is the leading globally in mobile financial services (MFS) which include a range of services from investments, payments, loans, insurance and a myriad of services (Mutsa, Hilary, & Yassir, 2017). This services enable customers to send and receive money using their mobile phones and it's a component provided by mobile network operators.

Over 50% mobile money service operators are in Africa, of this a hundred million are active mobile money accounts followed by the South Asia region with a market share of 40 million users who represent 2.6 % of adults (GSMA, 2017). In between the period 2013 to 2016, active mobile money users grew by more than 30%. According to the Global System for Mobile Communication Association (GSMA, 2017). The GSMA is working with the mobile network operators to create a robust mobile money ecosystem which will increase the relevancy of these services, and ensure their sustainability so that they can transform the financial lives of the underserved people (GSMA, 2017).

To achieve financial inclusion, economic empowerment and economic growth, mobile money services must become a central monetization mechanism (GSMA, 2017).

## Africa is the world leader in mobile money.

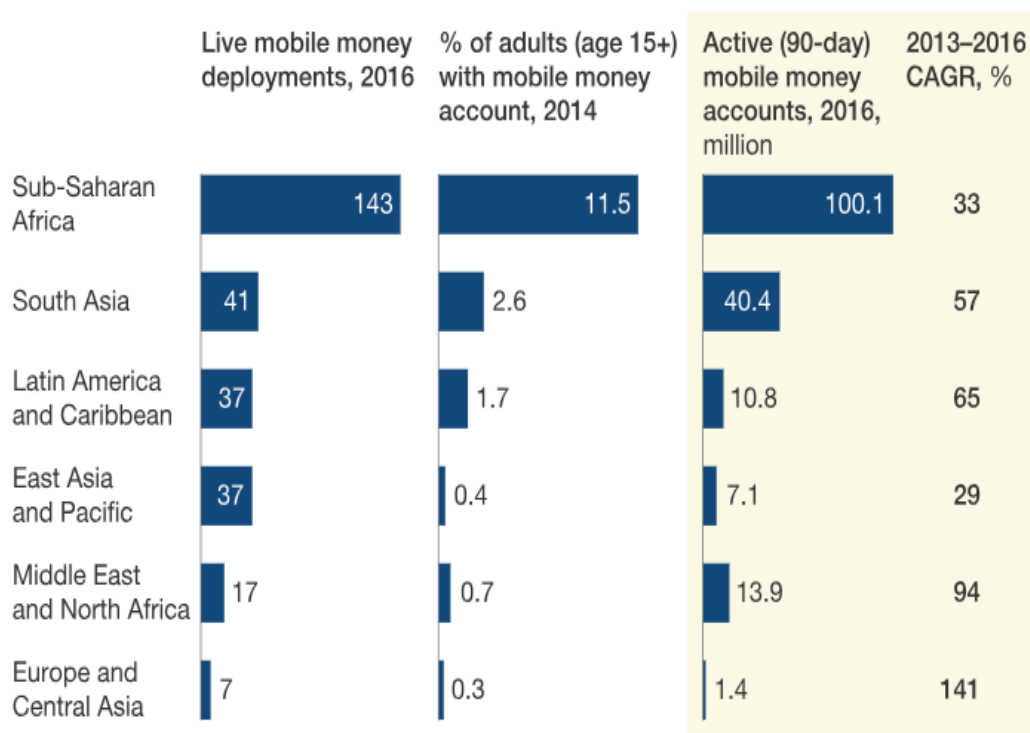


Figure 1 Source GSMA state of industry report 2016; World Bank global index

According to a report released by the CBK on the use of payment channels only 5% of Kenyans send or receive payments internationally (CBK, 2016), more Kenyans used mobile money services to send money outside the country in the year 2016 compared to 2013. While 42% of Kenyans used these services to make payments, interact with their financial institutions and pay for goods and services.

Mobile money services usage create opportunities for commercial banks to offer services across a geographically sparse area and the ability to upsell and cross sell products to their customers. These services are also believed to deliver greater real time access to products and services and can be used as a channel to serve complementary services like loans and deposits to bank accounts. It also gives

insights to banks and can be used to provide customer intelligence that can be used in future to inform financial institutions of new product and services to be designed.

### **1.1.2 Operational Efficiency**

The term operational efficiency refers to how well an organisation manages its resources to realise profits (Hartman, 2014). The best way to maximize operational efficiency differs for each particular organisation. Entities therefore find themselves using same measurements and techniques to improve operational efficiency and remove inefficiencies that suffocate growth (Hartman, 2014).

To measure operational efficiency we use financial ratios, the basic efficiency ratio is computed by operating expenses divided by revenues. A lower result gives an indication of a greater level of efficiency, “Return on assets (ROA) is a ratio that determines the operational efficiency of a bank measuring the ability of an organization to generate income by utilizing company assets” Khrawish (2011). Operational efficiency is therefore the day to day planning of an organization to keep a balance between cost and productivity. This is done by identifying wasteful processes that reduce organizational profits by the reducing waste and increasing the benefits of assets. A firm should therefore produce more goods and services with less resources.

Operationally efficient transactions are the transactions that yield the highest return or traded for the highest margins. As such, organisations seek to earn the highest gross margin from services and products by bringing down costs to the lowest similarly, economies of scale in nearly all cases also improves operational efficiency.

### **1.1.3 Commercial Banking in Kenya**

The bank supervision report states that there are 43 commercial banks in Kenya, 40 are privately owned while the Kenyan government has the majority ownership in 3 institutions (CBK, 2017). 25 of the 40 banks are locally owned while 15 are foreign owned. In the commercial banking sector, the banking sector has accepted the use of mobile money services and most if not all the banks have designed products that integrate with the mobile network operators so as to enable their clients use these services. The most popular mobile money services include :- M-Pesa which is owned by Safaricom, Mshwari, Airtel Money owned by Airtel, Equitel owned by equity bank. Orange money owned by orange a French multinational telecommunications corporation and M-Coop cash offered by Co-Operative Bank (CBK, 2017).

According to the banking regulator CBK (2017) since the interest capping law was introduced following distresses from the public regarding the high cost of credit. This has brought a lot of competition within players in the industry and banks have resulted in devising strategies of coping with this challenges among others by deploying more efficient ways of carrying out their banking business for instance the use of mobile money services as opposed to the traditional banking activities as such banks are discouraging customers in banking halls by providing alternative ways of accessing services and money.

The CBK has licensed 3 MNOs according to the National Payment System (NPS) Act. These include “Airtel Networks Kenya Limited, Safaricom Limited, and Telkom Kenya Limited” (CBK, 2018) who are required to use interoperable payment systems. As at January 2018, mobile money subscriber accounts have grown to 37.8 million valued at 323 billion Kenya shillings in 1.4 billion transactions (CBK, 2018). It

appears like the mobile money services usage is increasing and banks are shifting to mobile money transactions as opposed to cash based transactions. This research seeks to find whether they improve service delivery to the banking sector which has become very competitive of late due to changes in the external factors for instance political, economic and other social factors.

## **1.2 Research Problem**

For commercial banks to service in any market they have to design services and products that are competitive and develop strategies that are sustainable. As such banks are embracing the use of mobile money to serve mass markets, increase the number of transactions, and reduce overhead costs that are associated with traditional banking models which require customers to visit banking halls. Hypothetically, the more transactions commercial banks drive the greater their chances to realize greater profit margins. The use of mobile money services can enable banks to cut down on non performing branches and staff while still serving markets. In principle this should ultimately result to an increase in the operating efficiencies while adding value to the banking services. This would also enable commercial banks to shift paradigms from handling transactions to having more personalized client services that could ultimately lead to customer satisfaction and brand loyalty increasing its operational efficiencies.

In Kenya most banks have embarked on creating products that employ the use mobile money services. Interoperability between the Mobile Network Operators (MNOs) and banks play a critical part in improving the use of these services, thereby expanding financial access to the unbanked.

According to the banking regulator reports CBK (2017) almost all banking institutions have enabled their customers to access money using mobile technologies. Whether the use of mobile money has improved the banking sector in terms of

financial performance and operational efficiency and by what rate is still under study by different researchers.

In a Qualitative Exploration of Mobile Money in Ghana, Allen (2018) found out that a well-connected financial system is imperative to a country's economic growth and success of many countries but there are infrastructural issues that exist denying most low income earners in rural areas access to financial services. This contradicts the concept of mobile money services which can be used in a wide geographical area and requires few infrastructural investments by banks. Contrary, in Botswana, a Pako (2013) discovered that MMS are likely to offer the possibility of access to savings and receiving remittances by the poor and would bridge the gap while Severino, Tonderai, & Life (2015) in a study conducted in Zimbabwe financial service providers were able to transform lives and resulted to a reduction of costs associated with traditional banking activities thus serving more clients even in rural regions.

In a research carried out on mobile money services and their role in Small Medium Enterprises (SME's) in Kenya it was established that mobile money systems had an impact on SME growth (Simiyu,2015). In another study in the Kenyan commercial banks seeking to establish "the effect of branchless banking on performance" conducted by Dzombo, Kilika, & Maingi (2017) concluded that "there was a significant negative effect on the performance of banks when e-banking was used in isolation with agency banking". The research recommended a further study to analyse the effect of individual components of e-banking. In another study it was established that banks don't use mobile money transactions though it had effect on the performance (Ngaruiya, 2014).



A study to determine “the effect of mobile money concluded that when e-money is used in seclusion” Dzombo 2017 found out there exists a negative effect on the performance of banks. (Dzombo et al., 2017). “Banking institutions have therefore come up with counter strategies like agency banking to neutralize the negative impact of mobile money on their services” (Muisyo, 2014). 7 years data from 2007 to 2015 show that mobile money transfer transaction had an insignificant relationship with economic growth (Nyasimi, 2016) though this is in contrary with what was established by Kimani (2015) that “mobile banking positively and significantly affects the operational efficiency of commercial banks in Kenya”.

Such contradiction in researches have necessitated further studies on the field of mobile money usage and its effect on operational performance in the commercial banks so as to settle the contrary findings from the different researchers and find out if the use of these services have any effect in operational efficiency.

### **1.3 Objectives of the Study**

The objective of this study is to examine the effect of mobile money services on the operational efficiency of commercial banks in Kenya.

### **1.4 Value of the Study**

The study will shed more light on the importance of mobile money services for both banks and financial institutions. It will inform them on the financial effect of mobile money services on the operational efficiency. To the management in commercial banks, this study will be of great significance in realising the importance of mobile money systems and how they help financial inclusion, increase customer base and reduce transactional costs and overheads. To academicians and students of management, banking, finance, telecommunication and other faculties, the study will

build on the existing knowledge by adding the relevant literature on the field of mobile money services and operational efficiency in banks and financial institutions.

The lessons learnt section will assist future researchers on their conceptual and empirical research in the future and in the validation of future findings.

To government institutions it will provide valuable information for them to deploy useful strategies for effective and efficient banking platforms that increase performance. This will contribute immensely to the formulation of effective policies and procedures in commercial banks and in the use of mobile money services. To the telecommunications sector it will inform them on how their platforms affect the banking industry, to develop suitable products or support payment systems whilst regulating the fast growing mobile money systems and how they can mutually benefit from the systems.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

This chapter presents deeper understanding of the study available in the field of mobile money and its impact on the operational efficiency. In this chapter we are going to summarise findings from studies done across the globe and locally in Kenya. The research shall examine theories from different studies and attempt to find out the impacts of mobile money services and the effect it has on the operational efficiency in commercial banks. We shall achieve insights into the findings of other studies and their contribution towards the existing body of knowledge.

### **Adoption of Mobile Money Systems and Operational Efficiency**

Technology is changing rapidly in today's world. Systems developed by mobile network operators have resulted to the emergence of numeral business opportunities that can be exploited by the banking industry to increase revenues and cut on costs. Of relevance is the mobile money services that has offered billions of people globally a leeway to a broad spectrum of banking products and services. This has made financial services available to a wide geographical area with minimum of no investment made by the institutions. Using mobile money systems less trips are made to the banking hall. The banks can reduce the number of staff and still serve more clients across a region while reducing paperwork and focus more on its core operations.

Efficiency in banking has been defined based on the scope of efficiency targeted according to Chen (2001), this consists of technical, scope, scale and allocative efficiency (Chen, 2001). In the banking and financial institutions operational efficiency is related to a spectrum of its operations such as profitability and quality services to customers therefore in the banking sector. In the business of banking, more

emphasis is given on taking up deposits, lending out money and expansion of banking services and products especially to the unbanked. Improving operational efficiency is more pronounced with the adaption of new technology. This has empowered commercial banks to increase capacity and process huge volumes of transactions.

## **2.1 Theoretical Review**

This section reviews a number of theories that are key in guiding the study consisting of concepts and theories that govern operational efficiency in commercial banks. Of significance to the study is the UTAUT, the TCE and the Diffusion of innovation theory.

### **2.1.1 Transaction Cost Economics (TCE)**

If an organization wanted to know the components that they would make in-house, or which should it outsource or produce, or if the organisation was interested in determining if to borrow or to acquire equity financing. Though they appear to be in different contexts all these questions are of the same subject of determining how a complex relationship between different variables or parties need to be governed so as to avoid wastage and create transaction value. This theory is one of the most suitable in influencing such decisions in that it is a theory of a firm (Chandler, 1990).

Ronald H. Coase, in 1937 pioneered the theory for organizational efficiency in describing how a multifaceted deal will be directed and designed so that wastage can be reduced. The objective of efficiency is to get the best organisational strategy of identify the best alternative that will provide the most adequate features of a transaction (Coase, 1960). In this study we shall use the theory to determine if banks should adopt mobile money services or make decisions not to. TCE is a central theory in management more so in strategy as it points out important concerns as to why firms

in the first place exist, how to govern operations of these firms and set up their boundaries.

### 2.1.2 Diffusion of Innovation Theory

This theory was popularized by Rogers in the year 1962 from the synthesis of over 508 studies. Using his synthesis, he developed a theory of innovations among organizations and individuals Rogers (1962). According to Rogers (1962) the theory states that “the pioneering works in adopting innovations eventually lead to the Diffusion of Innovations theory (DoI)”. He argued that to adopt an innovation it was dependent on the perceptions of the members of a social system i.e. “the relative advantage, its compatibility, its Complexity, Trialability and its observability. The perceptions regarding these attributes represent predictors of innovation adoption and diffusion of the use of mobile money systems in the Kenyan banking industry as not all banks adopt the technology and those that adopt don’t do it at the same time as per the theory. The theory categorises innovators as depicted below in figure 2. This would be used to prove or explain why some banks adopt internet banking before others.

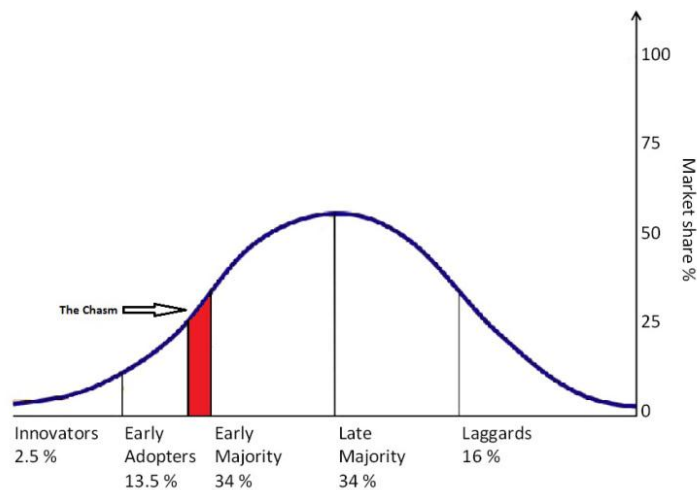


Figure 2 Innovation Adoption Curve (Roger, 1995)

### 2.1.3 Unified Theory of Acceptance and Use of Technology (UTAUT)

The (UTAUT) was pioneered by Venkatesh, Morris, Davis and Davis (2003) “The UTAUT aims to explain user intentions to use an information system and subsequent usage behavior”. Ideally, the theory holds that four key builds as depicted in figure 3 below which are determinants to the usage intention and behavior and four key constructs on usage intention and behavior (Venkatesh, Morris, Davis & Davis, 2003)

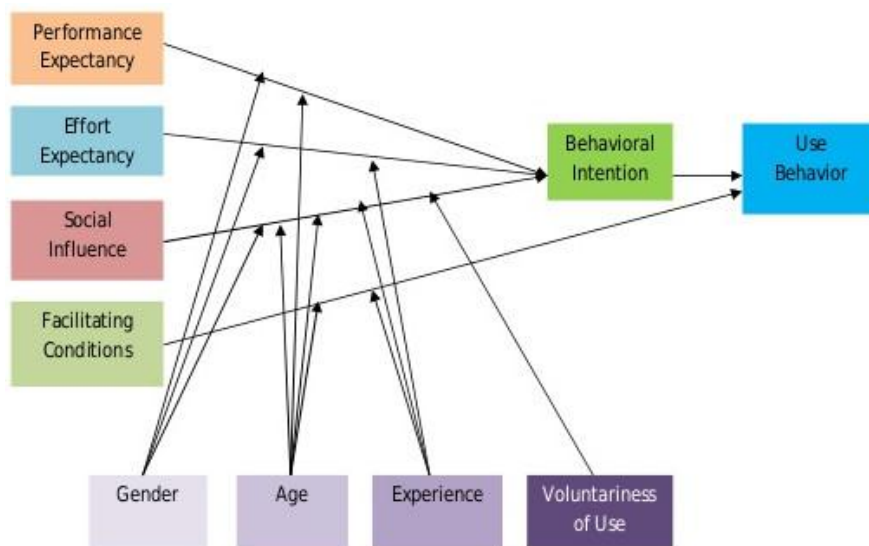


Figure 3 the (UTAUT) (Venkatesh, Morris, Davis and Davis, 2003)

The Information technology systems acceptance has numerous competing models, each with different sets of acceptance determinants. This study will be moored on this theory. For purposes of our hypothesis, the adoption of mobile money in commercial banks is guided by the user’s perceived ease of use and of systems and the associated cost saving, efficiency and financial gain.

### 2.3 Determinants of Operational efficiency in Banks

Operational efficiency is defined as the ratio between the input to run a business and the output gained from the business (Allen & Strahan, 2002). Input is classified as cost, people or effort while Outputs are revenue, margin, or cash, customer loyalty,

speed & agility, complexity or opportunities created. The ultimate goal of commercial banks is profit all measures, strategies, objectives that are designed or performed thereof are meant to realize this grand objective.

## **2.4 Empirical Studies**

A study conducted to establish the effect of mobile money transactions on the financial performance of enterprises (Ngaruiya, Bosire & Kamau, 2014) discovered “that mobile money transactions have a huge effect on revenue” the researchers recommended that enterprises that don’t enable their customers to utilize mobile money transactions should adopt this services to increase their performance. It was established that most of the respondents never used mobile money services to borrow money while some of the respondents rarely used it for lending purposes. In the study it was also established that “a majority of the respondent’s realised increased sales revenue after allowing their customers to transact using mobile money” (Ngaruiya et al., 2014).

A research conducted on all Kenyan banks to find out the relationship between mobile banking and the effect it has on operations, found out that mobile banking positively affected the operational efficiency in commercial banks (Kimani, 2015) “This was attributed to the fact that the as funds were moved using mobile money services it improved the operational performance of the banks”. In similar study conducted to establish the effect of mobile money transfer services on the economic growth, (Nyasimi, 2016) studied 7 year data from 2007 to the year 2014 and found out that there was “a positive relationship between mobile money transfer services and the growth of the economy”. It was concluded that the frequency of mobile money

transactions affected the economy positively as it had a positive and insignificant relationship with economic growth (Nyasimi, 2016).

In Kakamega town a study carried out in banks revealed that MMS “had a significant positive impact on the performance of the banks” (Muisyo, 2014) however, “banking institutions came up with counter strategies like agency banking and mobile banking among others in order to neutralize the negative impact of mobile money on their services”. Later on, in the year 2017, a research evaluating the effect of branchless banking on the performance of Kenyan banks established that indeed agency banking had a negative and significant effect on bank’s performance. It is noteworthy that when the two are used in separately, there is a significant negative effect performance but when both agency and electronic money were used together there was a positive effect (Dzombo et al, 2017).

In Gaborone, Botswana, BancABC a financial services provider with a revenue of 34.52 million USD after tax and worth 1.81 Billion dollars in 2015 was studied to find out “the effect mobile money transfer services had any on traditional banking services”. The researcher wanted to understand the opportunities created by the different mobile money transfer services to BancABC and the challenges they had to deal with. “It was found out that there was a need for banks to do away with the way of doing business in order to remain competitive” (Munalye, 2015).

In Brazil, a pilot project on mobile payment system involving a number of financial institutions from microfinance, institutions retail banks and MNO’s it was established that technical platforms are easy to operate (Eduardo, 2013). The project though considered to be a failure in operational terms, brought about important aspects regarding the establishment and maintenance of systems for mobile payments in



Brazil and it was established that financial institutions need to focus on poor clients to reduce the number of unbanked people. In essence the problem was not technology or how to maintain technology but on the adoption of the technology especially to the poor.

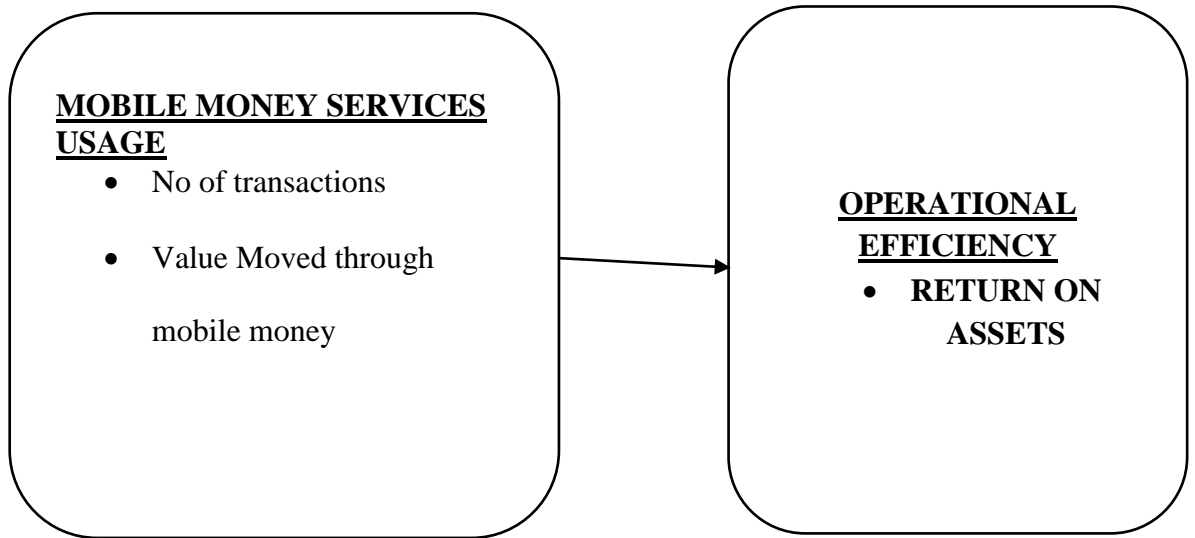
Similarly, in Botswana, a study conducted on the factors affecting adoption of MMS in the financial sector revealed that gross income did not determine the use of mobile usage (Pako, 2013). The researcher stated that MMS are likely to offer the possibility of access to savings and receiving remittances by the poor and would bridge the gap. Still in the southern Africa region Zimbabwe, a study on the impact of mobile banking on traditional banking practices, found out that banks did not lose customers to the mobile financial services providers. This was due to customer loyalty (Severino, Tonderai, & Life, 2015). According to the research there was a reduction in the traditional banking transactions which resulted to the decongestion of banks. This enabled the financial service providers to transform the lives and resulted to a reduction of costs associated with traditional banking activities. This transformed the way banking activities were carried out and as a result it increased the number of transactions thus they were able to generate more fees from these transactions and generated more revenues for the government.

## **2.4 Summary of Literature Review**

Volumes of the researches indicate that mobile money services usage has an effect on the operational efficiency of banks. Some of the researchers found out that mobile money alone has reduces the performances of banks. In this research we want to focus on the operational efficiency which all the researchers tend to point out that it has a positive effect when it comes to improving customer satisfaction and by enabling

commercial banks serve a bigger market niche, increasing revenues by the increased number of transactions and by cutting on transactional costs.

## 2.5 Conceptual Framework



*Figure 4: Conceptual framework, Source Author*

## **CHAPTER THREE: RESEARCH METHODOLOGY**

This section sheds light on the procedures that the researcher will use to find, present data and discuss the analysis and findings of the study. This will include particulars of the research and data collection. The techniques through which the data will be analyzed and presented is also discussed.

### **3.1 Research Design**

This is the blueprint for conducting our study how ever we must have extreme control over all factors that are likely to interfere with the validity of the findings. It is therefore a plan describing how we analyze the data and Information. This study will adopt a descriptive research design. “Descriptive research describes things as possible behavior, attitudes, values and characteristics and reports the way things are” (Mugenda & Mugenda, 2003). It can also be used to develop theories. The researcher will analyze the balance sheet items of costs and profits, from bank websites and reports by the Central Bank.

### **3.2 Population**

Population is the larger set of observations which comprises of all items in the field that is being studied or researched also referred to as the universe, while a smaller set of items being studies is referred to as a sample (Cooper & Schindler, 2008). For the purposes of the research the target population will comprise of all commercial banks as at the 31<sup>st</sup> of December 2017 this will exclude the 3 under receivership CBK (2018).

### **3.3 Sampling**

The target population will comprise of forty three (43) licensed commercial banks (CBK, 2017), except for the 3 under receivership. The data will be for the period 2015 - 2017.

### **3.4 Data Collection**

The researcher will rely on secondary data from secondary sources that that will include; financial institutions reports, Central Bank reports, economic journals, and statistical publications published by research firms. The type of data collected will cover the market sizes for the past 3 years.

### **3.5 Data Analysis**

This study will use both descriptive and inferential statistics in analysing the data. The data analysis procedure will follow the usual four-stage phases used in research: data cleaning, reduction, differentiation and explanation. Cleaning data will involve editing, coding and tabulation with an aim of detecting errors. Analysis will be done mainly using (SPSS) program. Descriptive statistics which consists of: - mean, frequencies and percentages for each specified variable will be calculated. Visual summaries of the data will be displayed using tables, pie charts, bar charts and line charts. To find out the relationship between the variables the inferential tests of Pearson Product-Moment Correlation Coefficient and regression analysis will be used. Exploration of the relationships will be based on the Pearson's correlation coefficient.

### 3.6 Analytical Model

The model aims to look at the relationship between adoption of mobile money services and the operational efficiency in Commercial banks. The regression model that we are going to use is as below:-

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \epsilon_t$$

Where Y= Operational efficiency of Commercial banks (Revenue/operational costs Ratio)

$\alpha$  = Estimated value of Y when all the other variables are zero

$X_1$  - Annual value of cash moved through mobile transfer

$X_2$  - Number of mobile money transactions

$\epsilon_t$  - Error term

Where  $\beta_j, j=1, 2$ , being the slope coefficients indicating the relationship between operational performance of banks and mobile money services indexed by the return on assets.

### 3.7 Test of Significance

The researcher will employ tests of significance tools such as Analysis of variance (ANOVA), Correlation coefficient (R), Coefficient of determination ( $R^2$ ), and the F Statistic at 95% confidence level.

## **CHAPTER FOUR: DATA ANALYSIS, RESULTS & DISCUSSION**

### **4.1 Introduction**

This chapter analyses the data on the usage of mobile money services and operational efficiency of banks in Kenya as set out in Chapter Three. The data for the three year period 2015 to 2017 was studied.

### **4.2 Response Rate**

Out of the 43 banks 3 are in receivership and 2 did not provide ROA data for the year 2015 while 2 banks did not provide data for the year 2017. This gave the response rate of 83.72% from the 36 banks.

### **4.3 Validity and Reliability**

Data was obtained from the CBK which is the regulator of all banks in Kenya who are authorized by the government of Kenya to oversee the banking industry therefore validity of the data was ensured.

### **4.4 Descriptive Statistics**

The research will rely on the use of descriptive statistics to describe the basic features of the data that has been collected from secondary sources to be able to provide simple summaries about the survey and depict them in simple graphs and tables.

#### 4.4.1 Number of mobile money users

In line with objective one of the study, Table 1 below shows the descriptive statistics for the number of mobile money accounts for the period under study.

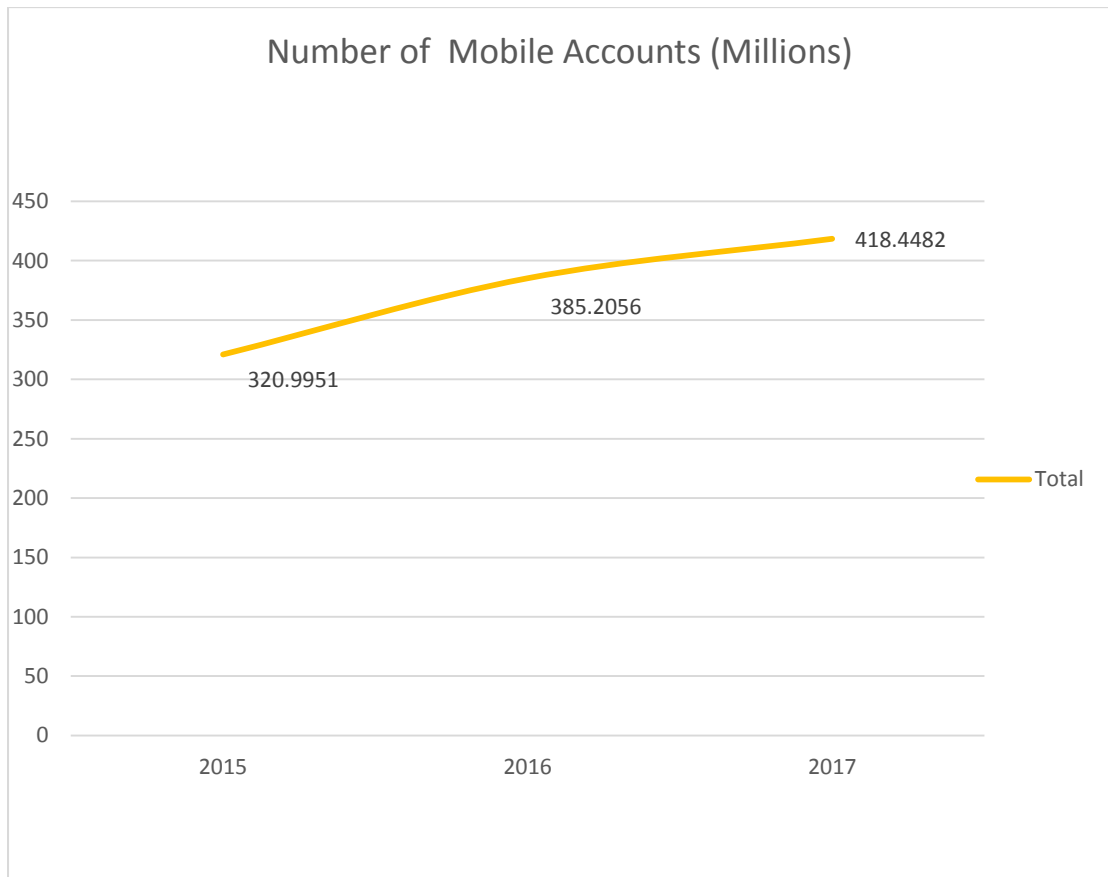


Figure 5 Number of accounts

The total number of mobile accounts has been on the rise since 2015. There was a 20.3% increase between 2015 and 2016. An 8.6% increase in the number of mobile accounts was recorded between 2016 and 2017. The numbers are in millions.



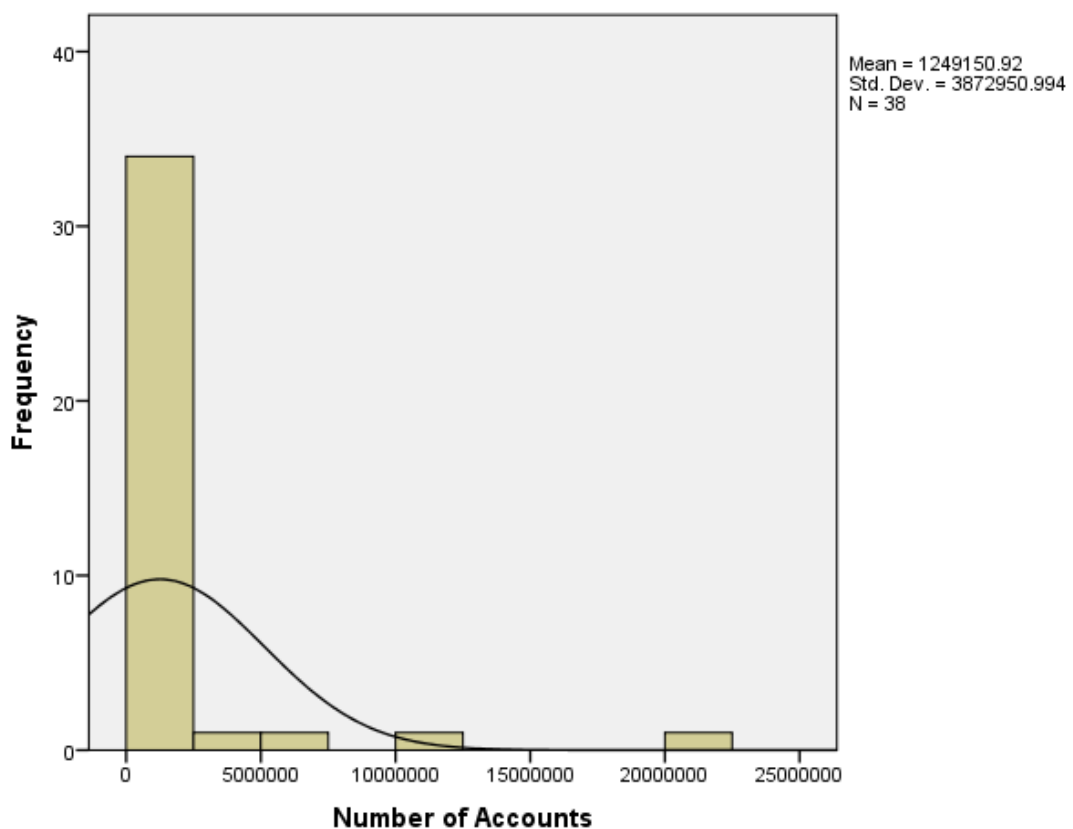
Table 1: Number of mobile accounts

Descriptive Statistics		Accounts (2015)	Accounts (2016)	Accounts (2017)
N	Statistic	42.00	42.00	39.00
Range	Statistic	34,647,780.00	41,139,935.00	47,474,830.00
Minimum	Statistic	1,803.00	1,536.00	1,830.00
Maximum	Statistic	34,649,583.00	41,141,471.00	47,476,660.00
Sum	Statistic	69,299,166.00	82,282,942.00	94,944,395.00
Mean	Statistic	1,649,980.14	1,959,117.67	2,434,471.67
Std. Deviation	Statistic	5,758,846.60	6,917,824.49	8,330,632.91
Skewness	Statistic	5.04	4.96	4.72
	Std. Error	0.37	0.37	0.38
Kurtosis	Statistic	27.70	26.59	23.96
	Std. Error	0.72	0.72	0.74

The table details mobile money accounts as well the distribution of the accounts across banks. There seems to be a high positive skewness of 5.04, 4.95 and 4.7 for the three years respectively, it is clear that extremely few banks have more than 5,000,000 mobile money users.

This phenomenon is visualized by the histogram in the figure below. The kurtosis for the number of accounts was 27.700, 26.589, 23.960 for 2015, 2016 and 2017 respectively. The high kurtotic element in the data implies that the number of mobile transactions across banks deviates from a normal distribution, i.e. banks do not generally have a common mean number of accounts since some banks have higher customer base than others. Therefore banks do not generally have a common mean number of accounts since some banks have higher customer base than others.

Figure 6 Number of mobile accounts.



#### 4.4.2 Return on investment

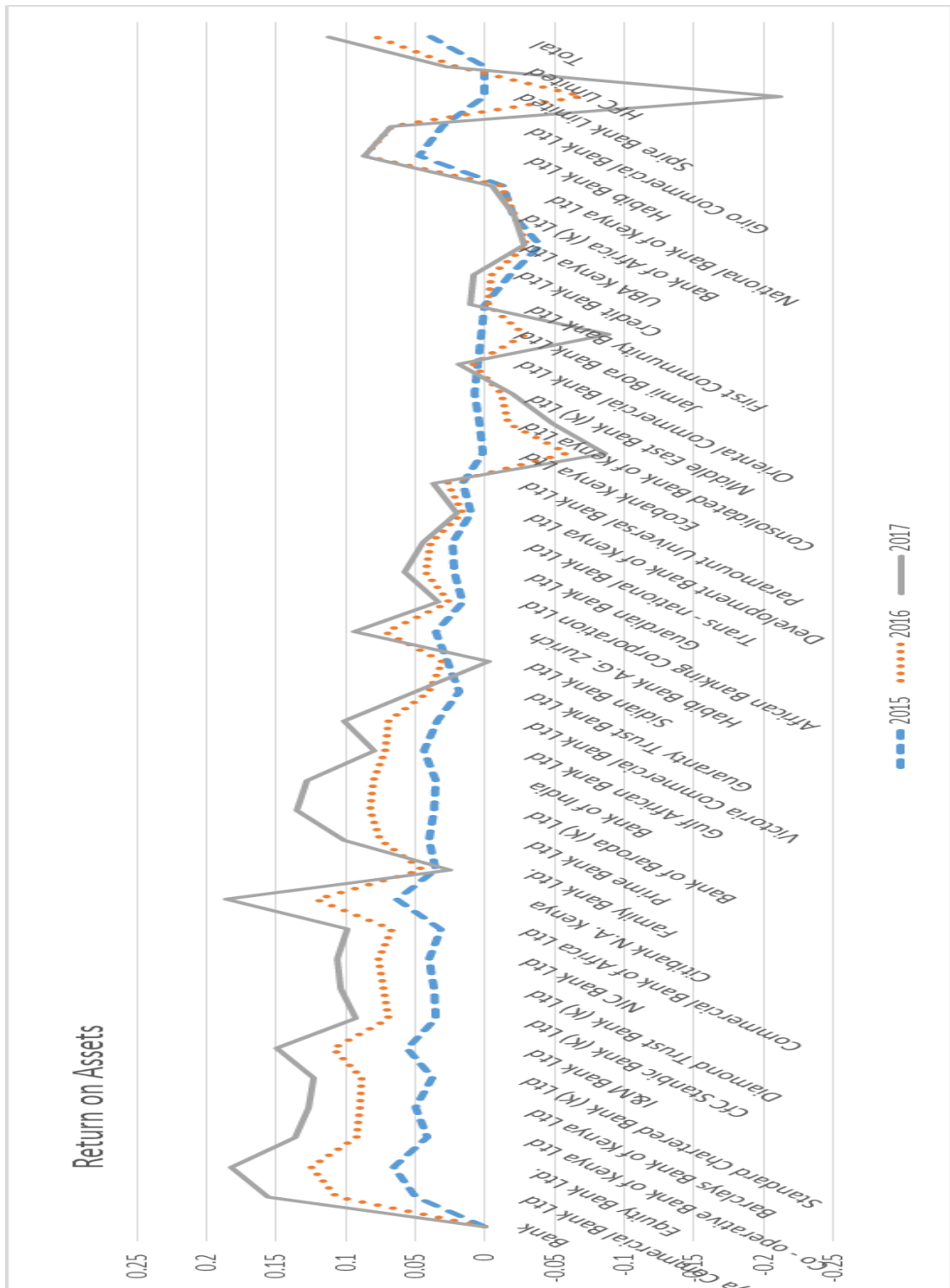
Table 2 below aligns objective two of the study by detailing the descriptive aspects of the measures associated with operational performance in Kenyan banks. Going per ROA of 2.4643, banks performed better in 2015 than in 2016 and 2017. The 2015 ROA was almost uniform across banks, as seen in the figure 8 below.

The kurtosis for the ROA were 0.207, 1.584 and 6.991 for 2015, 2016 and 2017 respectively. The high kurtotic element in the data implies that the number of mobile transactions across banks deviates from a normal distribution.

*Table 2 Descriptive statistics for measures of operational efficiency.*

<b>Descriptive Statistics</b>		<b>ROA (2015)</b>	<b>ROA (2016)</b>	<b>ROA (2017)</b>
N	Statistic	37	39	37
Minimum	Statistic	-3.91	-7.01	-14.14
Maximum	Statistic	6.56	6.00	6.49
Sum	Statistic	91.18	75.74	40.91
Mean	Statistic	2.4643	1.9421	1.1057
Std. Deviation	Statistic	2.39739	3.02134	3.71925
Skewness	Statistic	-.660	-1.168	-2.055
	Std. Error	.388	.378	.388
Kurtosis	Statistic	.207	1.584	6.991
	Std. Error	.759	.741	.759

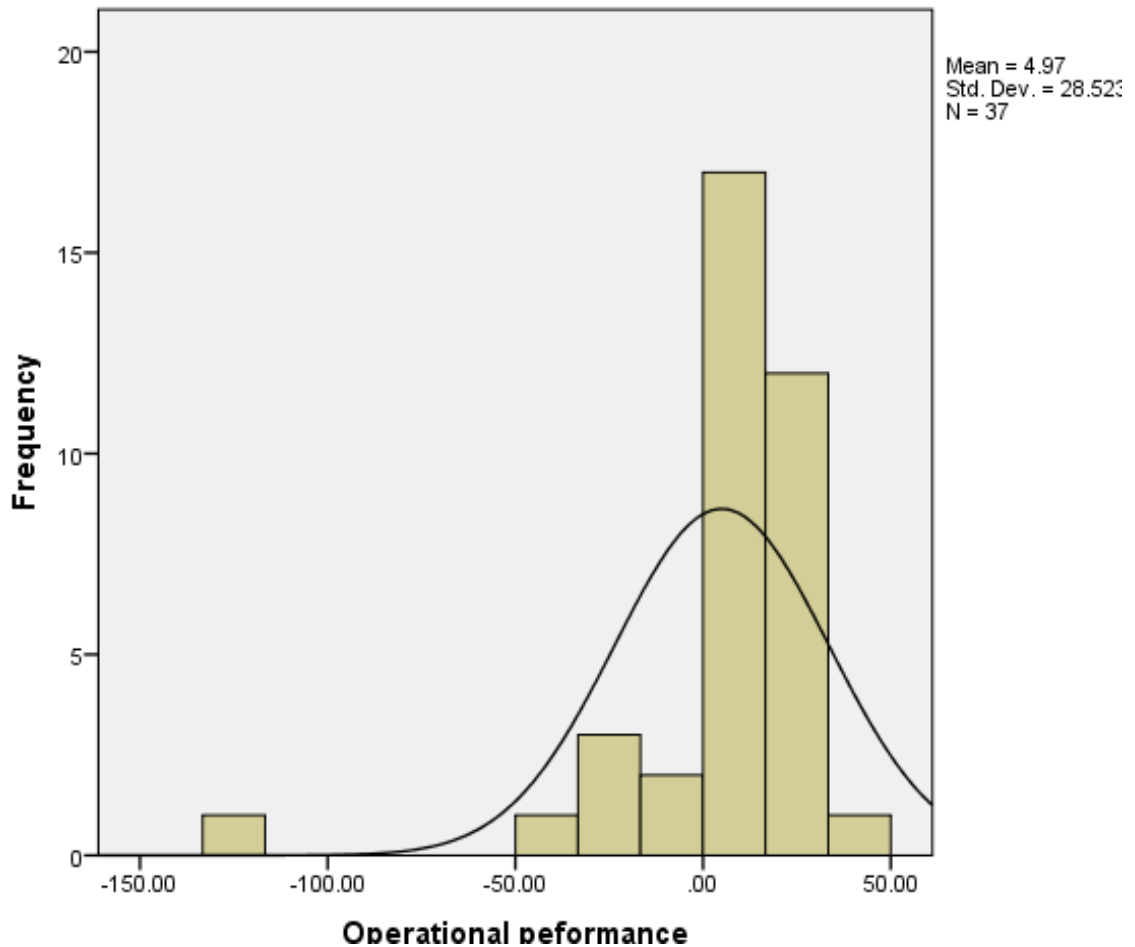
Figure 7 Operational performance (ROA) indicators across banks



The graph above shows the operational performance of the banks for the 3 years (2015 – 2017) arranged from the top tier 1 banks to tier 3 banks. The mean value of annual transactions for the three years was KSh. 286.157 billion while its standard

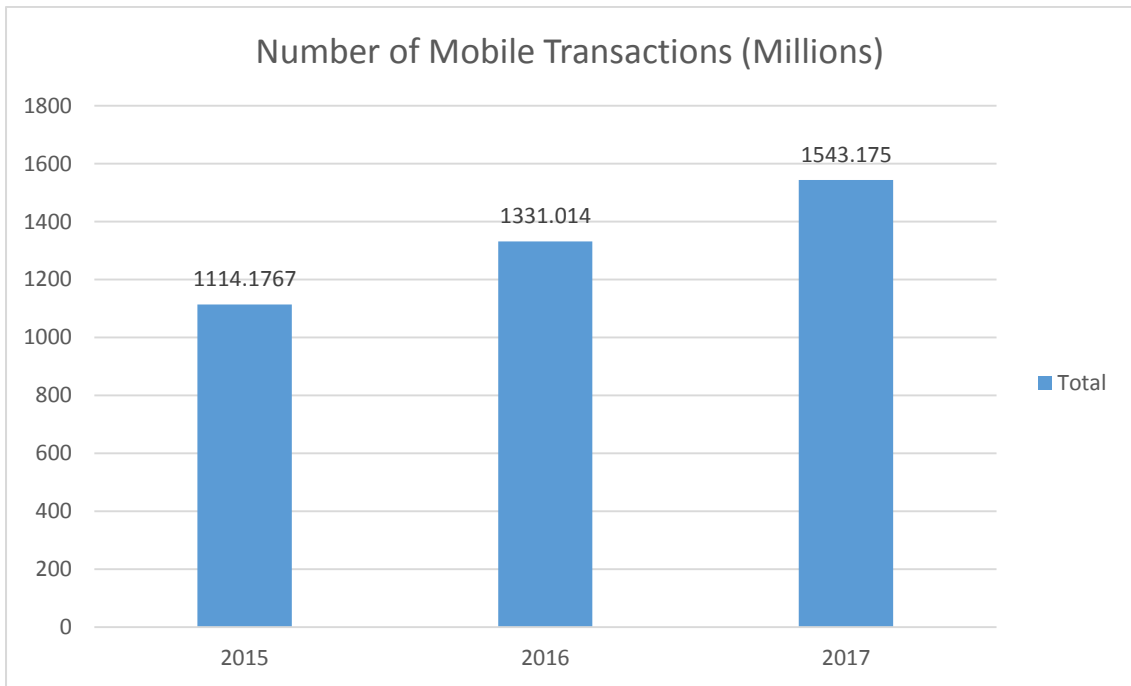
deviation was KSh. 37.455 billion. In 2016 the figure rose by 39.76% which again rose in 2017 by 26.58%.

Figure 8. Operational Performance.

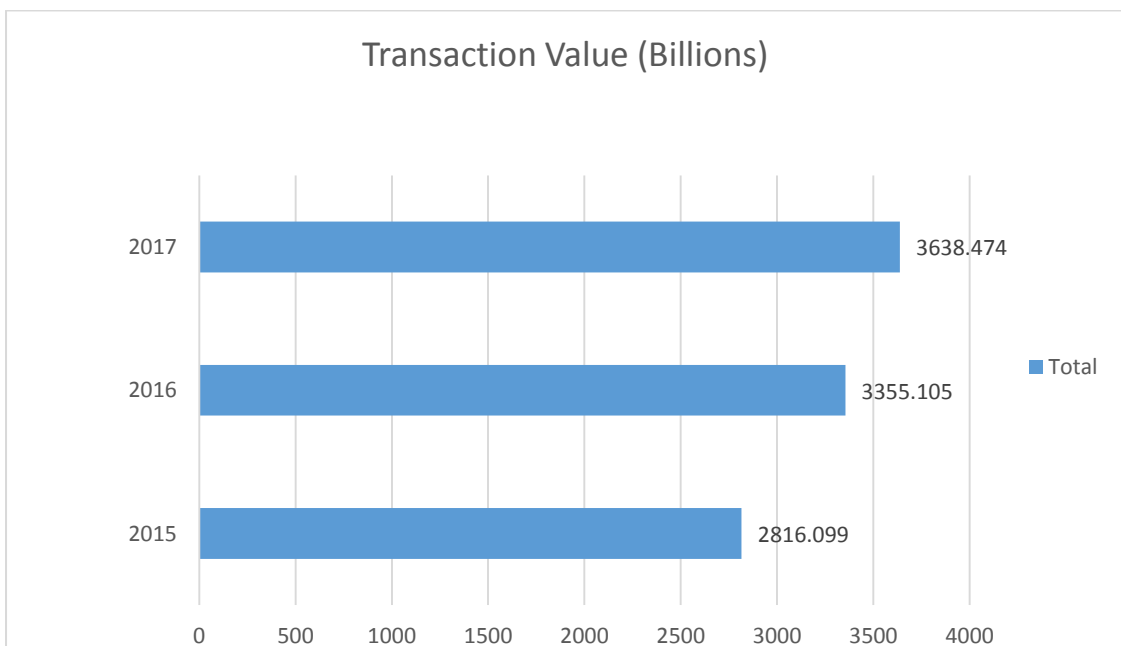


The operational performance negatively skewed owing to outliers. In the commercial banks some banks are very inefficient while others are very efficient in their operations. This could be attributed to a number of factors some of which are under study.

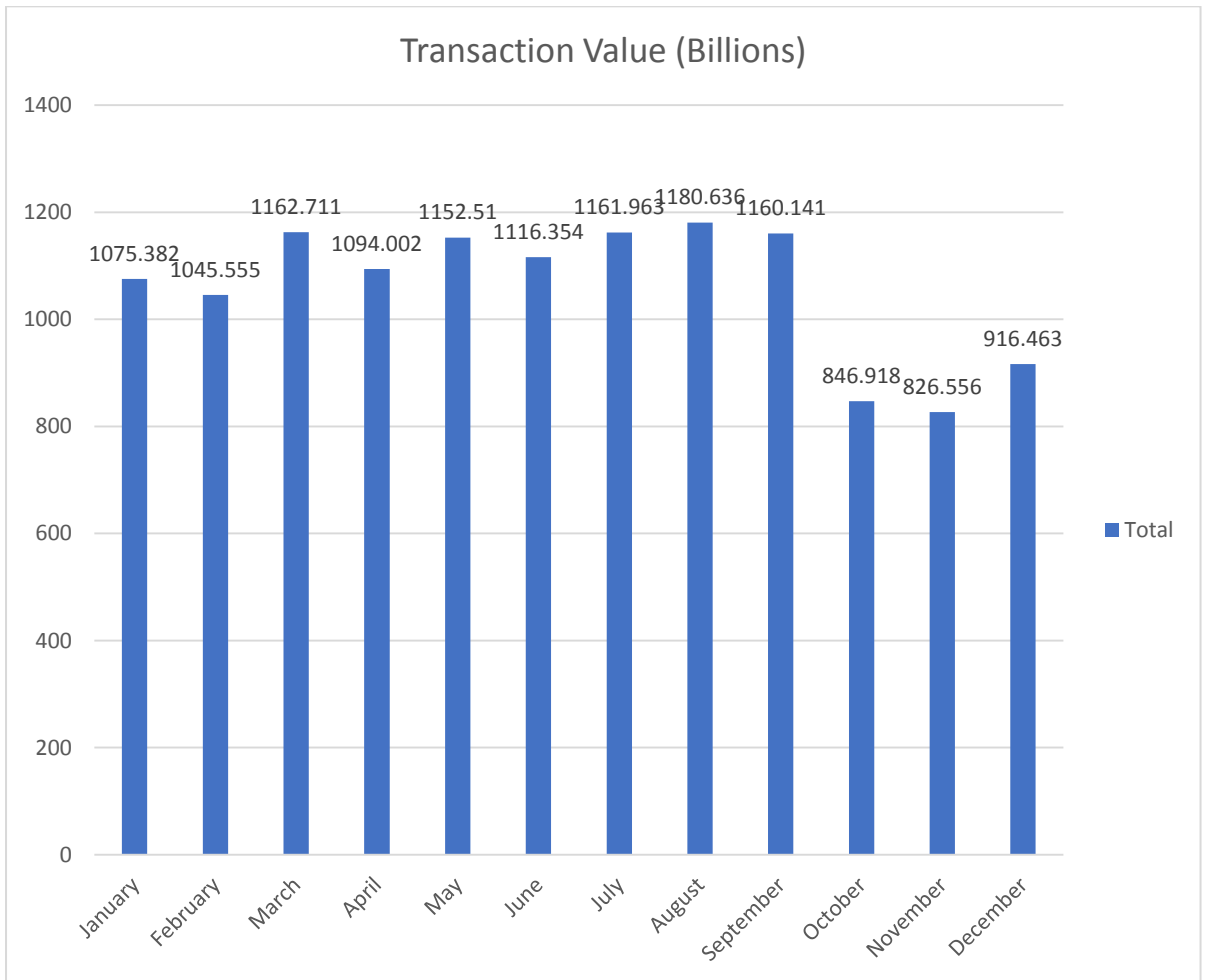
### 4.4.3 Annual value of transactions



The number of mobile transactions increased by 38.5% between 2015 and 2017 by 429 (million) transactions.



The number of mobile transactions increased by 29.2% between 2015 and 2017 by a value of 822.371 (billions)



Across the period of study (2015- 2018) the 3 months that recorded the highest transaction values through mobile was August, March & July in descending order.

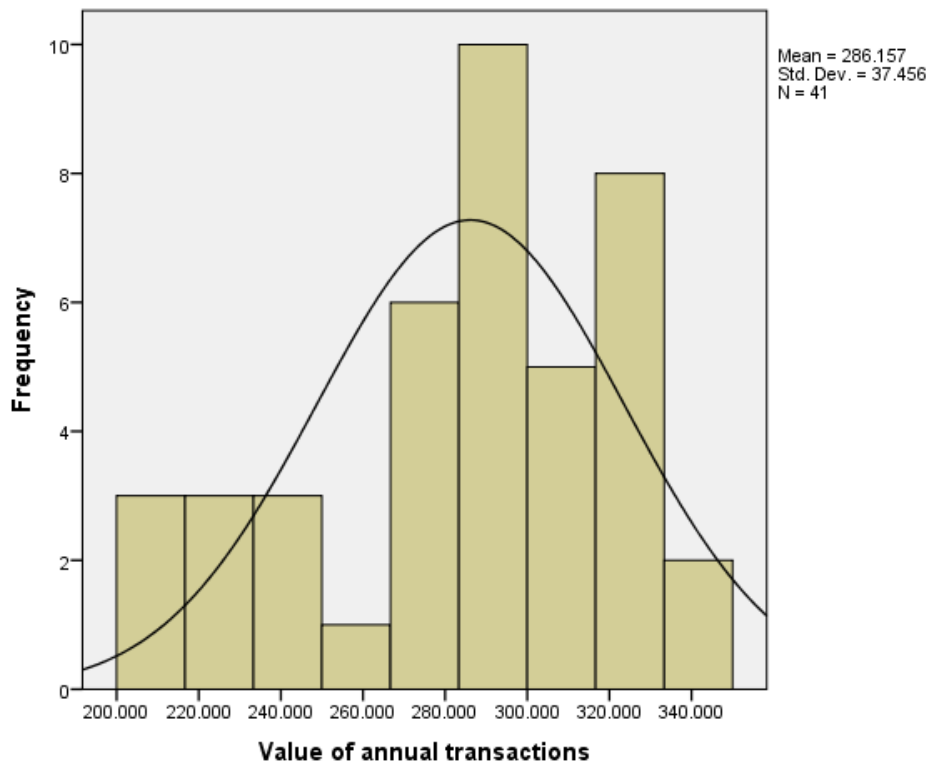


Figure 9. Annual value of mobile transactions in banks.

#### 4.5 Correlation Analysis

From the correlation analysis, it was found that number of accounts and operational performance are weakly correlated at 0.346, however the correlation is significant since it is less than 0.05 (0.018.) On the other hand, the value of annual transactions and operational performance are highly correlated at 0.807 with significance value 0.0001.

There exists a significant relationship between the value of annual transactions conducted through mobile money and the operational performance of Kenyan banks, so does the number of accounts and the annual value of such transactions



<b>CORRELATIONS</b>		<b>OPERATIONAL PEFORMANCE</b>	<b>NUMBER OF ACCOUNTS</b>	<b>VALUE OF ANNUAL TRANSACTIONS</b>
Pearson Correlation	Operational Performance	1.000	.346	.807
	Number of Accounts	.346	1.000	.458
	Value of annual transactions	.807	.458	1.000
Sig. (1-tailed)	Operational Performance	.	.018	.000
	Number of Accounts	.018	.	.002
	Value of annual transactions	.000	.002	.

*Table 3. Correlation matrix.*

#### **4.6 Regression Analysis and Hypotheses Testing**

ANOVA reported the significance of regression model as 0.0001 which is highly significant, i.e., there is 0.0001 probability that the changes observed in operational performance are attributable to chance.

Table 3 Operational Performance (ROA)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F
1	.807	.651	.631	17.32702	.651	31.776	2	34	.000

Similarly, the coefficient of determination in Table 4 below shows that 65% of variation in operational performance is caused by Number of Accounts and Value of annual transactions.

*Table 5. ANOVA table*

ANOVA	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	19079.908	2	9539.954	31.776	.000
	Residual	10207.665	34	300.225		
	Total	29287.573	36			

The ANOVA table above shows the significance of the model relating the three variables together. The significance of 0.0001 indicates the model is statistically significant and can be used for prediction, in this case to predict the operational performance given the value of transactions and the number of transaction, at 95% level of confidence.

Table 6. Model coefficients

Model Coefficients		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-182.263	25.673		-7.100	.000
	Number of Accounts	-4.485E-007	.000	-.030	-.267	.791
	Value of annual transactions	.668	.093	.821	7.204	.000

Going as per Table 6 above, the research model  $Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \epsilon t$  becomes;

$$Y = -182.263 + 0.668X_1 - 4.485E-007X_2 \text{ where;}$$

Therefore the equation becomes

$$Y = -182.263 + 0.668X_1$$

The constant term is significant at 95% level of confidence with significance level of 0.0001. When the number of accounts and the value of transaction are zero, the value of annual transactions  $e$  is a negative quantity.

The coefficient of number of accounts is not significant in determining the operational efficiency, its significance is 0.791.

The coefficient for the value of transaction is very significant at 95% level of confidence with 0.0001 level of significance. This means the constant term and the value of annual transaction play key roles in determining operational efficiency in Kenyan banks. A unit increase in value of annual transactions registers a rise in operational efficiency by a scale of 0.668, keeping number of accounts constant.

## **4.7 Discussion of Research Findings**

It was established from the research that operational efficiency is a variable predictable by assessing the behaviours of the number of accounts and value of annual transactions. Since operational performance is 65.1% influenced by these two factors, it is imperative that to improve the operational efficiency of banks one needs to put focus on the two independent variables.

The transactional cost economics theory dictates that the objective of efficiency is to get the best organizational strategy of identifying the best alternative that will provide the most adequate features of a transaction (Coarse, 1960) banks should embrace the use of mobile money because it improves on the operational performance of commercial banks. Rogers (1962) argued that in order to adopt an innovation it was dependent on the perceptions of the members of a social system. In the Kenyan commercial banking context some of the banks have not adopted mobile money services while others use it a lot this is in line with this theory, and the fact that the adoption of mobile money in commercial banks seems to be guided by the user's perceived ease of use which we have proved that there are associated efficiency and financial gain in the use of mobile money services which again validates the UTAUT theory.

The goal of commercial banks is profit all measures, objectives that are designed or performed thereof are meant to realize this grand objective and therefore banks should use mobile money services to realize more gross margins. Ngaruiya, Bosire & Kamau, (2014) discovered that mobile money transactions have a huge effect on revenue which we have also found out in the research. Nyasimi, (2016) also from a similar study found out that "there was a positive relationship between mobile money

transfer services with economic growth”. Muisyo (2014) also found out that “MMS had a significant positive impact on the performance of the banks”. Munalye (2015) recommended that there was a need for banks to do away with the way of doing business in order to remain competitive.

## **CHAPTER FIVE: SUMMARY, CONCLUSIONS & RECOMMENDATIONS**

### **5.1 Introduction**

This section explains in detail what happens with the association of the three variables of interest should one independent variable be subjected to deliberate or natural change. It also highlights the recommendations arising from and limitations of the study.

### **5.2 Summary of Findings**

Kenyan banks have adopted mobile banking on a large scale, this is supported by the number of accounts that were 1,649,980.14 in 2015, 1,959,117.67 in 2016 and 2,434,471.67 in 2017. On the same note, the value of transactions rose from 442,231.36 in 2015 to 734,181.99 in 2016 and again to 1,074,820.40 in 2017. However, operational performance is seen to decline from 2015 to 2017 even though the regression model and correlation analysis confirm presence of a linear relationship between operational performance and the number transactions and the value of annual transactions.

This in essence means that the number of mobile transaction does not matter a lot what really matters is the transactional amount which seems to have a strong and positive effect on the ROA of the banks.

### **5.3 Conclusions**

The research has found out that 65 % of operational performance is associated or rather determined by the usage of the MMS in the commercial banks. Therefore it is

statistically correct and has been proven in this research that the use of MMS is key in improving the operational performance of banks.

Having a lot of mobile money accounts and transactions is also good for banks though it has a weak relationship with the ROA and it does influence the operational efficiency much. The number of accounts has a negative influence though quite insignificant, whereas the value of transactions does in a positive way to a great extent.

## **5.4 Recommendations**

From the study it is evident that commercial banks should embrace the usage of mobile money services to increase operational performance and which will increase their gross margins. This will later translate to an increase the shareholders dividends, improved customer services due to focus on personalized services from the traditional transactional processing which will lead to higher customer satisfaction which is another measure of operational efficiency

CBK the banking regulator should encourage banks to adopt the services and ensure that there are no bottle necks in the use of the MMS as has been the case in some countries like Zimbabwe where banks had issues with the adoption of such technologies.

## **5.5 Limitations of the Study**

Not all banks were studied some did not provide data and the regulator did not have the figures as such the results are not conclusive though the commercial institutions that did not respond might have a small probability of influencing or affecting the results.

The variables of interest are naturally subject to annual factors that may contribute to biasedness. That is, the factors influencing a variable one year are not necessarily the same as that of the following or previous year.

## **5.6 Suggestions for Further Studies**

Further studies should be conducted to establish the types of accounts in commercial banks that are most profitable when linked with mobile money. The issue of security in the mobile money usage should also be studied and lastly the percentage of mobile money usage and how it is trending in the country should also be investigated as it keeps on changing with time.



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## APPENDIXES

### Appendix ii: Number of Accounts Using Mobile Money services

Number of Accounts			
Bank	2015	2016	2017
KCB Bank Kenya Ltd	3,794,579	4,593,721	5,585,922
Co-operative Bank of Kenya Ltd	2,849,185	2,938,638	3,221,883
Equity Bank Ltd	8,780,150	9,316,353	10,141,831
Barclays Bank of Kenya Ltd	1,502,421	1,633,376	1,531,284
Standard Chartered Bank Ltd	217,832	220,343	205,163
Commercial Bank of Africa Ltd	12,933,945	17,501,968	21,486,990
Diamond Trust Bank Kenya Ltd	655,543	793,704	844,008
Stanbic Bank (Kenya) Ltd	134,301	138,559	159,308
NIC Bank Ltd	90,790	101,374	115,581
I & M Bank Ltd	98,918	112,551	131,501
National Bank of Kenya Ltd	695,392	520,095	597,649
Citibank N.A. Kenya	2,035	2,031	1,973
Family Bank Ltd	1,793,664	2,006,843	2,112,943
Bank of Baroda Ltd	43,462	45,856	47,162
Bank of Africa Kenya Ltd	82,464	108,428	119,996
Prime Bank Ltd	24,297	29,195	30,395
HFC Limited	74,409	107,681	85,605
Ecobank Kenya Ltd	39,380	59,037	54,410
Bank of India	16,374	15,337	15,780
Guaranty Trust Bank Ltd	17,439	17,722	15,711
Gulf African Bank Ltd	68,835	77,985	87,712
African Banking Corporation Ltd	32,883	35,945	37,172
Victoria Commercial Bank Ltd	3,670	3,875	4,436
Sidian Bank Ltd	244,702	256,558	255,809
Giro Commercial Bank Ltd	8,281	7,551	
Fidelity Commercial Bank Ltd	8,975	6,252	
Development Bank of Kenya Ltd	1,904	1,687	1,917
Jamii Bora Bank Ltd	122,251	136,913	130,355
Spire Bank Ltd	20,705	23,208	23,574
First Community Bank Ltd	123,562	144,855	214,470
Guardian Bank Ltd	10,462	11,855	10,550
Consolidated Bank of Kenya Ltd	49,098	48,147	51,841
Habib Bank A.G. Zurich	5,592	5,453	5,102
Trans- National Bank Ltd	55,655	67,949	85,201
Habib Bank Ltd	3,992	3,904	
Paramount Bank Ltd	8,560	9,671	8,077
M-Oriental Commercial Bank Ltd	4,842	4,300	4,284
Credit Bank Ltd	16,817	24,318	30,116
Middle East Bank (Kenya) Ltd	1,803	1,876	1,830
UBA Kenya Bank Ltd	5,593	1,536	5,373
Charterhouse Bank Ltd	4,821	4,821	4,821
<b>Totals</b>	<b>34,649,583</b>	<b>41,141,471</b>	<b>47,476,660</b>

### Appendix iii: Operational Performance (ROA)

	2015	2016	2017
Bank	ROA	ROA	ROA
Kenya Commercial Bank Ltd	5.01%	5.64%	4.94%
Equity Bank Ltd.	6.56%	6.00%	5.68%
Co - operative Bank of Kenya Ltd	4.14%	5.15%	4.31%
Barclays Bank of Kenya Ltd	5.01%	4.02%	3.68%
Standard Chartered Bank (K) Ltd	3.83%	5.10%	3.34%
I&M Bank Ltd	5.66%	5.27%	4.09%
CFC Stanbic Bank (K) Ltd	3.56%	3.37%	2.34%
Diamond Trust Bank (K) Ltd	3.69%	3.64%	3.05%
NIC Bank Ltd	3.99%	3.66%	2.94%
Commercial Bank of Africa Ltd	3.14%	3.60%	3.13%
Citibank N.A. Kenya	6.33%	5.84%	6.49%
Family Bank Ltd.	3.55%	0.91%	-1.99%
Prime Bank Ltd	3.99%	3.57%	2.59%
Bank of Baroda (K) Ltd	3.65%	4.67%	5.26%
Bank of India	3.49%	4.57%	4.72%
Gulf African Bank Ltd	4.42%	2.78%	0.81%
Victoria Commercial Bank Ltd	3.38%	3.55%	3.27%
Guaranty Trust Bank Ltd	1.86%	2.23%	0.87%
Sidian Bank Ltd	2.72%	0.30%	-3.28%
Habib Bank A.G. Zurich	3.53%	3.65%	2.19%
African Banking Corporation Ltd	1.61%	0.99%	0.82%
Guardian Bank Ltd	2.25%	2.05%	1.44%
Trans - national Bank Ltd	2.39%	1.53%	0.52%
Development Bank of Kenya Ltd	1.05%	0.58%	0.35%
Paramount Universal Bank Ltd	1.60%	1.11%	1.01%
Ecobank Kenya Ltd	0.18%	-6.13%	-2.68%
Consolidated Bank of Kenya Ltd	0.35%	-1.99%	-3.26%
Middle East Bank (K) Ltd	0.75%	-1.93%	-0.81%
Oriental Commercial Bank Ltd	0.49%	0.36%	1.10%
Jamii Bora Bank Ltd	0.22%	-3.12%	-5.93%
First Community Bank Ltd	0.07%	-0.28%	1.25%
Credit Bank Ltd	-1.74%	1.30%	1.24%
UBA Kenya Ltd	-3.91%	0.89%	0.21%
Bank of Africa (K) Ltd	-2.07%	-0.03%	0.06%
National Bank of Kenya Ltd	-1.34%	0.14%	0.67%
Habib Bank Ltd	4.74%	3.94%	
Giro Commercial Bank Ltd	3.03%	3.70%	
Spire Bank Limited		-7.01%	-14.14%
HFC Limited		2.12%	0.63%
<b>Total</b>	<b>3.86%</b>	<b>3.99%</b>	<b>3.33%</b>