

**EFFECT OF MOBILE LENDING ON FINANCIAL
PERFORMANCE OF COMMERCIAL BANKS IN KENYA**

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DECLARATION

I, the undersigned, declare that this is my original work and has not been presented to any institution or university other than the University of Nairobi for examination.

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This research project has been submitted for examination with my approval as the University Supervisor.

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DEDICATION

I wish to dedicate the project to my late beloved mum Madam Immaculate Nduku, all my sisters and brothers.

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LIST OF ABBREVIATIONS

ANOVA	Analysis of Variance
ATM	Automated Teller Machine
CBK	Central Bank of Kenya
FP	Financial Performance
KCB	Kenya Commercial Bank
NIM	Net Interest Margin
NPL	Non-Performing Loans
NSE	Nairobi Securities Exchange
ROA	Return on Assets
TAM	Technology Acceptance Model
VIF	Variance Inflation Factors

ABSTRACT

Mobile lending is aimed at increasing the customer base which can in turn increase the profitability of the banks. The mobile application has made it easy for the commercial banks to transact especially lending loans to its customer throughout the county regardless of the distance. Stiff competition among the commercial banks has forced the commercial banks to invest more in mobile lending to remain competitive in this competitive environment. This study sought to determine how mobile lending influences financial performance of banks in Kenya. 42 banks in operation in Kenya as at 31st December 2018 were the population of the study. Data from 33 banks was availed for the study which was 78.57% response rate. The predictor variable was mobile lending. The control variables were capital adequacy, liquidity, credit risk and bank size. Financial performance was given by ROA and it was the dependent variable. Secondary data was acquired for 5 years (January 2014 to December 2018) on an annual basis. Research design was descriptive cross-sectional design whereas association between variables was determined by multiple linear regression model. SPSS version 22 was used in data analysis. An R-square value of 0.402 that can be translated to mean 40.2% of the variations in financial performance of banks in Kenya can be related to the six chosen predictor variables whereas 59.8% in the changes of performance of banks was linked to other variables that did not form part of this study. From the study it was further revealed that the predictor variables strongly correlated with financial performance ($R=0.634$). ANOVA results indicate that the F statistic was substantial at 5% level with a $p=0.000$. Hence it was appropriate in providing an explanation of the relationship between the variables. Additionally, results demonstrated that that mobile lending, liquidity and bank size were positively and statistically substantial values in the study. The study discovered that credit risk have a negative and statistically significant impact on financial performance of banks. The recommendation is that measures should be set up to increase mobile lending, liquidity and bank size as these three has a substantial positive impact on financial performance.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

In today's fast changing world, businesses find themselves having no choice but to keep up with the changes in the market and therefore, innovation has become a norm in their respective industries. It is risky for a business to not fully grasp the change in service delivery that its market niche requires. It is even riskier when most players in the market respond to potential challenges with a blanket solution (Abernathy & Utterback, 2015). Technological enhancements for instance mobile lending are happening at a tremendously heightened rise in the global banking industry. The increased adoption of mobile lending by commercial banks is aimed at improving Financial Performance (FP) in terms of reduced cost of operations and also in terms of improved market reach and customer service (Dabholkar, 2016). According to Nofie (2011), mobile lending has the potential to significantly improve performance of commercial banks.

This study drew support from a number of theories such as the diffusion of innovation theory, technology acceptance model, and the financial intermediation theory that have attempted to elaborate the relationships between FP of banks and mobile lending. Mises (1912), developed the financial intermediation theory which pose that financial institutions have a critical role where they gather deposits and lend them out to get interest thus for them to boost their performance, they have to enhance deposits from their clients through creation of ways that would make it easy and convenient for customers to transact. The way through which a new idea is communicated to members of a specific social system by use of a chosen preference channel is referred to as Diffusion of innovation (Rogers, 1995). Technology Acceptance Model (TAM) gives

a clarification of the manner in which clients accept and utilize an innovative idea. TAM was utilized in finding out how technology acceptance impacts mobile lending amongst commercial banks in Kenya in this study.

In Kenyan banking sector, a lot of dynamism is being witnessed in the business environment which has been attributed to increased technological growth, competition and globalization. Commercial banks have embraced the use of mobile platforms in order to minimize the costs of operations and reach a wider market. Ngaruiya (2014) posited that mobile lending improves the manner in which financial transactions are undertaken and makes it easy for unreached groups to easily access financial services. A positive factor about mobile lending is their ability to offer financial solutions to the lowest income earners that were otherwise excluded from the traditional banking system.

1.1.1 Mobile Lending

Mobile lending deals with making investments using recent technology so as to improve the revenue system and enhance efficiency and effectiveness of the system (Sheleg & Kohali, 2011). Mobile lending involves automation of systems and structures that are crucial in order to improve and simplify lending (Kigen, 2010). With mobile lending as a modern system in banks, revenue generation can be mobilized and this can increase as well as expand revenue base and financial transactions of goods and services (Health Finance and Governance, 2013). Various studies have defined mobile lending as the new technologies supporting money transfer services and financial transactions operated under financial regulation and performed by financial

institutions via the mobile phone as opposed to the traditional over-the-counter transactions (John, Fredrick & Jagongo, 2014).

Financial inventions like mobile lending are happening very fast in world banking industry. Instead of transacting over the counter in commercial banks, customers are enabled to transact through their mobile phone devices. Mobile lending allows those unable to access financial institutions or without a bank account to perform financial transactions as quickly and easily as sending a text message. Studies done in Kenya reveals that mobile lending has not only led to increased number of individuals enrolling for banking services but also increased revenue for commercial banks as a result of transactions fees and interest income (Kigen 2010).

Adoption of mobile lending contributes in minimization of cost of operations and in being efficient and effective as service provider. The banks saves the cost of opening new branches because mobile lending enables bank reach customers and penetrate new markets. Mobile lending enables the banks to maximize the income collection that is not supported by any funding (Sheleg & Kohali, 2011). Previous studies have operationalized mobile lending in terms of either number of mobile loan applicants, value of mobile loans or as a proportion of mobile loans to total loans. In this study, mobile lending will be operationalized as the ratio of mobile lending to total lending.

1.1.2 Financial Performance

Almajali, Alamro and Al-Soub (2012) define FP as a firm's ability to achieve the range of set financial goals such as profitability. FP is a degree of the extent to which a firm's financial benchmarks has been achieved or surpassed. It shows the extent at which financial objectives are being accomplished. As outlined by Baba and Nasieku (2016)

FP show how a company utilizes assets in the generation of revenues and thus it gives direction to the stakeholder in their decision making. Nzuve (2016) asserts that the health of the bank industry largely depends on their FP which is used to indicate the strengths and weaknesses of individual banks. Moreover, the government and regulatory agencies are interested on how banks perform for the regulation purposes.

The focus of FP is majorly on items that directly alter the statements of finance or the firm's reports (Omondi & Muturi, 2013). The firm's performance is the main external parties' tool of appraisal (Bonn, 2000). Hence this explains why firm's performance is used as the gauge. The attainment level of the objectives of the firm describes its performance. The results obtained from achieving objectives of a firm both internal and external, is the FP (Lin, 2008). Several names are given to performance, including growth, competitiveness and survival (Nyamita, 2014).

Measurement of FP can be done using a number of ratios, for instance, Net Interest Margin (NIM) and Return on Assets (ROA). This is a measure that indicates the capability of the bank to make use of the available assets to make profits (Milinović, 2014). ROA is calculated by dividing operating profit by total asset ratio which is used for calculating earnings from all company's financial resources. On the other hand, NIM measures the spread of the paid out interest to the lenders of banks, for instance, liability accounts, and the interest income that the banks generates in relation to the value of their assets. Dividing the net interest income by total earnings assets expresses the NIM variable (Crook, 2008).

1.1.3 Mobile Lending and Financial Performance

Mobile lending is aimed at growing the customer base that can as a result increase the profitability of the commercial banks. The mobile application has made it easy for the commercial banks to transact especially lending loans to its customer throughout the county regardless of the distance. Stiff competition among the commercial banks has forced the commercial banks to invest more in mobile lending to remain competitive in this competitive environment (Ross, 1998). According to bank focused theory by Lyman (2006), banks can derive more benefits from adopting innovations such as mobile lending in their business. According to this theory, mobile lending has more benefits which translate to improved FP of banks. Mobile lending has enhanced increased transactions by the commercial banks. This in turn leads to improved FP. Increase of transactions acts as a diversifying factor for the risks involved.

With reference to Harker and Zenios (2000), it's stated that mobile lending encourages more competitive force. Primarily, it opens up new conveyance channels, keeping in mind that those are not more cost effective for the organization; hence customers get the chance to rely on them and demand access. Nevertheless, before the bank branch was the main channel for the dispersion of financial services, we see today an assortment of channels eroding the branch's dominance. The economies of scale that lead to more incorporated automation cause more economies of scope effects. As financial establishments – in concurrence with all other retail services – understand that consumer satisfaction and loyalty lead to a fixed progression, they go for increasing the share of customers' wallets that they are servicing. With stage automation, a representative can get a single view of the whole customer relationship; economies of

scope can be made when a firm offers appropriate product mix to support its customer base.

Conventional lending involves so many procedures, processes, controls and resources which increases the cost of lending and consequently minimizes the return on loan portfolio. Mobile lending in nature requires less of administrative processes and most lenders will charge differently to advance such loan ranging from facility fees of 7.5 percent per loan to a one off 10 percent interest per month (Lerner & Tufano, 2011).

1.1.4 Commercial Banks in Kenya

The CBK defines a bank as a business which carries out, or intends to conduct banking activities in Kenya. Commercial banking business involves accepting deposits, giving credit, money remittances and any other financial services. The industry performs one of the very important role in the financial sector with a lot of emphasizes on mobilizing of savings and credit provision in the economy. According to the Bank Supervision yearly Report (2018), the banking industry comprises of the CBK as the legislative authority. The industry also has 1 mortgage finance, 42 commercial banks and 13 microfinance banks. Among the 42 commercial banks in the country 30 have local ownership while 12 have foreign ownership. 12 of the 42 are listed at the NSE.

Many changes have been made in the banking sector to improve their way of operation and performance. These events include an increase in competition for financial services, banking consolidation and technological innovation. The banks therefore are forced to focus more attention on areas enhancing performance such as providing services and products more efficiently and controlling costs in banking. The urge to reduce both administrative, operational costs and competition has led to the adoption of mobile

lending by banks (Mutua, 2010). A positive factor about mobile lending is their ability to offer financial solutions to the lowest income earners that were otherwise excluded from the traditional banking system (Ngaruiya, 2014).

Commercial banks improved performance will ensure that the shareholders get a return to their investment which triggers more investment thus increased economic growth. Low FP in contrast will lead to failure of financial market which may cause a financial crisis that hinders economic growth. Although there is a general register of good performance in the Kenyan banking industry, several banks are not doing well financially (Oloo, 2011). According to CBK (2018), pre-tax profits declined by 8.4 percent in the year 2018. The ratio of NPL to total loans increased to 12.6 percent in 2018 up from 9.6 percent in 2017. Solid capitalization as a result of capital injection and retained earnings was recorded over the period.

1.2 Research Problem

The banking sector in the world is continually adopting mobile lending as the means of allowing their clients to perform the banking services conveniently from their mobile phones. Mobile lending is convenient since it allows customers with busy schedules to perform any transactions anytime from any place. The clients will not need to go into the banking halls for the banking services, they are able to apply for, gain approval on and check status of a loan. Mobile lending has really revolutionized the banking industry, clients in the limited geographical areas no longer worry since they are able to access the banking services conveniently, the high transactions processing costs is a thing of the past because of the little charge on the transactions by the mobile phones (Kombe & Wafula, 2015).

The mobile lending in Kenya is continually transforming and shaping the banking industry. The banking industry in Kenya has put more emphasis on mobile lending as a strategic tool in achieving the corporate objective of profit maximization and cost minimization. The big question is whether there is comparative cost advantage by financial institutions which have adopted mobile lending from those who have not. Since 2008 KCB Bank group introduced KCB Mpesa in an effort to enlarge its customer base. Other banks such as Equity bank among others have followed suit. The current study seeks to investigate whether this development has an effect on FP of commercial banks in Kenya.

Several empirical studies have been carried out but most of them have not examined how mobile lending impacts FP. A study by Mohammad and Saad (2011) on the influence of electronic banking on performance of Jordanian banks over the period (2000 to 2010) concluded that electronic banking negatively affects banks' performance. Tchouassi (2012) used empirical studies from selected Sub –Saharan Countries to establish whether mobile phones actually contribute in extending banking services to the unbanked. The findings revealed that poor and vulnerable households in Sub-Saharan Africa nations often incur high financial transactions while undertaking basic financial transactions. Wadhe and Saluja (2015) explored how the profitability of banks in India was influenced by electronic banking and concluded that there is a substantial positive effect.

Locally, Mwiti (2016) did an examination of how alternative banking channels affect the FP of Kenyan commercial banks. The study showed that this affects FP of the banks both positively and the effect was statistically significant. Ndagijimana (2017) studied

the influence of mobile lending on FP of banks in Kenya and concluded that mobile lending positively and significantly affects the FP. Kamande (2018) studied how the performance of banks is affected by electronic banking in the Kenyan banking industry and established that electronic banking does have a positive contribution to their FP. From the foregoing, it is clear that there is no consensus on the relationship between mobile lending and FP. In addition, the available studies have operationalized mobile lending differently and this is the gap the current study leveraged on by answering the research question; what is the effect of mobile lending on FP of commercial banks in Kenya?

1.3 Research Objective

The study's intent was to determine how mobile lending impacts financial performance of commercial banks in Kenya.

1.4 Value of the Study

The results of the research are of great importance to theory as it will help in developing theories on mobile lending and FP of banks in Kenya. The results might also be significant to scholars and researchers, in identifying the research gaps on the related topics of the study as well as reviewing of the empirical literature to institute further areas of research.

The stakeholders of the banking industry and specifically the managers will find this research very useful as this study will generate vital information on how mobile lending influences FP of banks in Kenya. The management of the banks will derive the most out of this since it illuminates ways in which they can utilize mobile lending as a channel to improve financial performance in their banks.

To the government and other policy makers, this study's findings will help them to guide and formulate policies and guidelines that would assist commercial banks and other banks in the sector adopt mobile banking that will enhance their financial performance and therefore contribute to the sector performance.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

A review of theories which form the foundation of this study will be presented in this section. In addition, previous research carried before on this research topic and related areas are also discussed. The other sections of this chapter include determinants of financial performance, conceptual framework showing how the study variables relate and a literature review summary.

2.2 Theoretical Framework

This presents review of the relevant theories that explains the relationship between mobile lending and FP. The theoretical reviews covered are financial intermediation theory, diffusion of innovation theory and technology acceptance model.

2.2.1 Financial Intermediation Theory

The financial intermediation theory was advanced by Mises (1912) and postulates that that financial institutions especially banks play a significant role in financial intermediation. The banks play the role of mobilizing customers with surplus money and availing them for lending to those with a shortage at a cost commonly referred to as interest. This association allows the banks to create a state of liquidity since money is taken from customers with short term maturity funds and advanced to customers with long term maturity basis (Dewatripont, Tirole & Rochet, 2010). Mises (1912) argues that the banks' role as credit negotiators is characterized by lending borrowed money.

Financial intermediation through borrowing and lending money can thus be described as the key role of the banks. According to Mises (1912), involvement in financial

intermediation by banks denies them the role of creating money while retreating from the process presents them with a chance to create money. However Allen and Santomero (2001) criticize the theory on grounds that it perceives risk management as an emerging factor in the financial sector and puts the concept of participation costs at the front line. This theory is applicable to the study since bank FP could be enhanced by improving customer deposits through development of mobile lending that will facilitate easy and convenient undertaking of bank transactions by the customers.

2.2.2 Diffusion of Innovation Theory

Rogers (1995) was the pioneer of this theory. According to Mahajan and Peterson (1985), An object, practice or an idea that is presented into a social system newly for the first time is referred to as an innovation while on the other hand way through which the innovation is by the use of chosen mediums at a certain time within a social system. In this context, this theory seeks to describe the manner in which new inventions such as mobile banking and internet banking are adopted and used within a social system (Clarke, 1995).

According to Sevcik (2004), adoption of an innovation is not a onetime thing but it is a process which consumes time. He further argues that diffusion of innovation is impacted by change resistance because it decelerates the innovation adoption process. Innovation adoption process is influenced by five major attributes namely relative advantage, compatibility, complexity, observability and triability (Rogers, 1995). Rogers argues that the level of new innovations adoption is tied on the way through which a new organization views its relative advantage, triability, compatibility, complexity and observability. If a Kenyan organization views the rewards of internet

banking, then this innovation will be adopted when other prerequisite tools are available. Innovation adoption is faster in organizations with information technology departments and internet access as opposed to those without. The theory relates to the current study as it explains how innovations such as mobile lending are adopted in organizations.

2.2.3 Technology Acceptance Model

This model was proposed by Davis (1989) and is also called the TAM. This model covers the behavior of customer in adopting a new idea that is normally made so as to establish a system that will be utilized which will be beneficial and convenient to the clients. Earlier authors researched on the fundamental concept of TAMs authenticity in predicting individuals acceptance and the arrived to a conclusion that TAMs does not clarify how user's acceptance is affected upon by technology and other ease of use factors (Moon & Kim, 2015). Davis (1989) contends that anticipated usefulness refers to the belief by an individual that the technology or information system adopted will significantly improve job performance after its adoption. Perceived effortlessness of use indicates how easy it is for the individual to learn how to new technology and information system is operated. The model emphasizes on ease of use as a method to forecast the effectiveness of a system (Gefen, Karahanna & Straub, 2013).

Pikkarainen, Pikkarainen, Karjaluoto and Pahnla (2014) carried out a survey in Finland to establish the actual impact of perceived usefulness and concluded that it endeared use of inventive, autonomous, self-service and user friendly technologies to users through the banking system to provide financial services to clients in the twenty first century. Gerrard and Cunningham (2013) observed that the perceived usefulness

hinged on the rendered banking services. These services range from paying utility bills, checking account balances, loan applications, money transfer abroad, and getting pertinent mutual funds information.

Evidence points at how importance the perceived applicability of a technology is in the intention of adopting it. Tan and Teo (2013) contends that the adaptation of technology is influenced by the anticipated usefulness. In conclusion, the greater the supposed usefulness of embracing electronic banking practices, the higher the possibility of electronic banking will be embraced for (Potaloglu & Ekin, 2015). TAM variables are considered the key stimulants of acceptance of e-banking.

2.3 Determinants of Financial Performance

The determination of an organization's FP can be ascertained by a number of factors which can be either internal or external. Internal factors differ from one bank to the next and are within a bank's scope of manipulation. These consist of mobile lending, capital size, quality of management, efficiency of management, deposit liabilities, credit portfolio, policy of interest rate, ownership and bank size. External factors affecting the a bank's performance are mainly gross domestic product, Inflation, stability of macroeconomic policy, political instability and the rate of Interest (Athanasoglou, Brissimis & Delis, 2005).

2.3.1 Mobile Lending

Mobile lending is aimed at growing the customer base which can in turn increase the profitability of the commercial banks. The mobile application has made it easy for the commercial banks to transact especially lending loans to its customer throughout the county regardless of the distance. Stiff competition among the commercial banks has

forced the commercial banks to invest more in mobile lending to remain competitive in this competitive environment (Ross, 1998).

According to bank focused theory by Lyman (2006), banks can derive more benefits from adopting innovations such as mobile lending in their business. According to this theory, mobile lending has more benefits which translate to improved FP of banks. Mobile lending has enhanced increased transactions by the commercial banks. This in turn leads to improved FP. Increase of transactions acts as a diversifying factor for the risks involved.

2.3.2 Bank Size

Bank size determines the extent to which a firm is affected by legal and financial factors. The size of the bank is also closely linked with the capital adequacy because large banks raise less expensive capital and thus generate huge profits. Bank size is positively correlated with the ROA showing that large banks can attain economies of scales that reduce operational cost and hence help banks to improve their FP (Amato & Burson, 2007). Magweva and Marime (2016) link bank size to capital rations claiming that they are positively related to each other suggesting that as the size increases profitability rises.

According to Amato and Burson (2007), the size of an organization is primarily determined by the amount of assets it owns. An argument can be made that the larger the assets a firm owns, the more its ability to undertake a large number of projects with greater returns in comparison with small firms with a smaller amount of assets. Additionally, the bigger the firm, the larger the amount of collateral that can be pledged in a move to access credit facilities in comparison to their smaller competitors (Njoroge,

2014). Lee (2009) concluded that the amount of assets in control of a firm has an influence on the level of profitability of the said firm from one year to the next.

2.3.3 Bank Liquidity

Liquidity is defined as the degree in which an entity is able to honor debt obligations falling due in the next twelve months through cash or cash equivalents for example assets that are short term can be quickly converted into cash. Liquidity results from the managers' ability to fulfill their commitments that fall due to creditors without having to liquidate financial assets (Adam & Buckle, 2003).

According to Liargovas and Skandalis (2008), liquid assets can be used by firms for purposes of financing their activities and investments in instances where the external finance is not forthcoming. Firms with higher liquidity are able to deal with unexpected or unforeseen contingencies as well as cope with its obligations that fall. Almajali et al., (2012) noted that firm's liquidity may have high impact on efficiency of firms; therefore firms should aim at increasing their current assets while decreasing their current liabilities as per his recommendation. However, Jovanovic (1982) noted that an abundance of liquidity may at times result to more harm.

2.3.4 Credit Risk

This is vital and an expensive risk of a financial institution. The degree of this risk is among the dynamics which affects the health status of a bank. The value of assets controlled by a specific bank relies on the amount of credit risk, and the assets quality controlled through the bank also relies on liability to particular risks, tendencies on NPLs, and the cost-effectiveness of the debtors to the bank (Athanasoglou et al., 2009). Preferably, this ratio ought to be at a minimum. If the lending books are vulnerable to

risk in a smoothly operated bank, this would be reflected by advanced interest margins. On the other hand, if the ratio decreases it entails that the risk is not being appropriately recompensed by margins.

The asset of a bank asset comprises loans portfolio, current asset, fixed asset, and other investments. Asset quality in most cases gets better with age and size of a bank (Athanasoglou et al., 2005). The primary income generating assets of banks are loans. The quality of a loan portfolio therefore highly determines the value of a bank. Good quality Assets lowers the losses relating to NPLs, considering the fact that, the highest risk facing banks is the losses arising from delinquent loans (Dang, 2011).

2.3.5 Capital Adequacy

Rendering to Athanasoglou et al., (2005), capital is a significant variable in determining bank FP. Capital is the owner's contribution which supports the bank's activities and acts as a buffer against negative occurrence. In capital markets that are not perfect, well-capitalized banks must reduce borrowing so as to support a certain index of assets, and as a result of lower prospective bankruptcy costs they tend to face lower funding costs.

A well-capitalized bank has a signaling effect to the market that a performance above average is to be expected. Athanasoglou et al., (2005) realized that capital contributions positively affected bank profitability, which reflects sound financial condition of banks in Greece. Also, Berger et al., (1987) noted positive causality in both direction between capital contributions and profitability in companies.

2.3.6 Macro-economic Factors

Numerous studies have been undertaken to investigate macroeconomic factors effect on value of companies. The factors include but not limited to monetary aggregates, rate

of interest, investment level in the economy, consumer price index, producer price index, GDP growth, inflation, financial depth and the degree of market efficiency. Kwon and Song (2011) carried out a research on mergers in the Korean market. The study established that global financial crisis has significant negative effect on cumulative abnormal returns of acquiring company when a merger announcement is made. He also stated that it may be possible that investors are more averse to large cash outflows during a period of crisis. Flannery and Protopapadakis (2002) pointed out that inflation and money supply are well documented as the two macro-economic factors that have an effect that is significant on firm value.

2.4 Empirical Review

Local and international studies have been done to support the relationship between mobile lending and FP, but these studies have produced mixed results.

2.4.1 Global Studies

A study by Mohammad and Saad (2011) on the influence of electronic banking on performance of Jordanian banks over the period (2000 to 2010) concluded that electronic banking negatively affects banks' performance which was akin to the findings of Delgado, Hernando and Nieto (2007) and Siam (2006). Electronic banking adoption impacts on a bank's risk profile. The risk management principles issued by Basel Committee in July 2003 for electronic banking recognize the related risk factors and the committee's aim was to promote and enhance safety of services provided by online banking while observing flexibility in line with emerging technologies as a result of the turbulent environment.

Tchouassi (2012) used empirical studies from selected Sub-Saharan Countries to establish whether mobile phones actually contribute in extending banking services to the unbanked. The aim of the study was to find how mobile phones could be used to the unbanked and poor segment of the population. The findings revealed that poor and vulnerable households in Sub-Saharan Africa nations often incur high financial transactions while undertaking basic financial transactions. Therefore, the use of mobile phone could improve the provision of financial services in this segment and that technological and economic innovation, regulatory and policy innovation was required to extend this services.

Kajewski (2014) studied innovations: benefits, challenges and recommendations for practice in Australia in the banking sector. Descriptive research design was adopted. Secondary data was obtained from risk manuals and financial reports of a sample of 38 commercial banks in Australia. The data was analyzed by use of correlation analysis, autocorrelation techniques and regressions analysis. The study discovered that throughout the years, banks had progressively invested in the various technology platforms in an effort to improve financial access to their clientele. The study also found that the number of transactions had gone up as a result of these innovations. He observed a positive significant effect of innovation on banks profitability in that it reduced the cost of doing business and delivered services that were more efficient to the customers.

Wadhe and Saluja (2015) explored the on how the profitability banks in India from the period 2006 to 2014 was affected by E-banking. A sample of 31 Indian commercial banks was used. The effect of E-banking services on the commercial banks'

profitability was tested using the multiple regression analysis. The findings depicted a positive association between e-banking and profitability in the private sector as well as in the public sector banks'. Base on this study it was pointed that an increase in the number of ATMs was necessary so as to realize increased profitability. However, a negligible association existed between the amount of branches and the banks' profitability.

Wong (2018) carried out a study to analyze levels of consumer acceptance for mobile services in Hong Kong. Technology acceptance model was embraced in the study to establish attitudes towards use and perceived usefulness and ease of use of mobile services. This study sampled people aged over 20 using a convenience sampling technique by distributing 300 electronic questionnaires. The findings and conclusion denote that perceived usefulness and ease of use was important for customers who considered new technologies and innovativeness. Respondents were willing to try out new mobile services due to the fact that innovativeness was associated with value addition by the respondents.

2.4.2 Local Studies

Mwiti (2016) did an examination of the impact of alternative banking methods on the performance of Kenyan banks financially. His study used five year (2011-2015) data for analysis. Regression analysis was employed to determine how alternative banking channels affect the FP of the banks. His study indicated that a strong positive relationship between alternative banking channels and FP of the banks existed. The study further showed that alternate banking channels affect FP of the banks both positively and the effect was statistically significant.

Ndagijimana (2017) sought to ascertain the effect of mobile lending on FP of commercial banks in Kenya. Descriptive design was applied in the study while all banks were included in the study. Tertiary data was obtained from banks annual reports and was analyzed using both inferential and descriptive statistics to establish explanatory power of the selected independent variables. The study concludes that mobile lending positively and significantly affects the FP of banks in Kenya.

Kimeu (2018) carried out an empirical study to determine influence of mobile services usage and operational efficiency of banks in Kenya using secondary data obtained from the 43 licensed banks operating in Kenya between 2017-2017. The source of the data was reports from financial institutions, central bank, economic journals and statistical publications done by research organizations. The dependent variable, which was operational efficiency, was measured using the ratio of revenue to operational costs. Explanatory variables used in the study included in the regression model included number of mobile money transactions and annual value of cash moved through mobile transfer. The empirical findings indicated that 65% of variation in operational efficiency of banks was explained to the number of annual transactions and the number of accounts.

Kamande (2018) studied how electronic banking impacts FP of commercial banks in Kenya. He sampled all of the 42 banks operating in Kenya. The predictor variable was selected as electronic banking as measured by value of transactions carried out through mobile banking, internet banking, agency banking and ATMs. FP was selected as the response variable of the study and it was given by the ROA. Secondary data for 5 years was collected beginning January 2013 up to December 2017. The results revealed that

agency banking, ATMs, capital adequacy, liquidity and bank size had both a positive and significant effect on this study. It was also revealed that mobile banking and internet banking are statistically insignificant determinants of FP of banks. This study failed to take into account the effect of online banking on efficiency of banks in Kenya.

Kinyanzui, Kiriri and Achoki (2018) undertook a research to investigate on the impact of mobile credit on the operational efficiency of Kenyan banks using a mix of both primary and secondary data on credit accessibility and its effect on enterprises performance. A questionnaire with a mix of open ended and closed ended questions was used in collection of data. The multiple linear regression method was embraced in undertaking data analysis. The study measured operational efficiency in terms of earnings per share, ROA and the proportion of non-performing loans. Mobile credit was measured in terms of enterprises being able to use mobile phones to undertake transactions such as make payments, collect loan repayments and make disbursements to shareholders. The study findings indicated that the proportion of non-performing loans decreased after mobile credit introduction an indication that debt collection operational efficiency had improved. Mobile credit introduction improved operational efficiency of enterprises in that brand image, the ability to adapt to changes in the market as well as improved perception of reliability in customer's minds.

2.5 Conceptual Framework

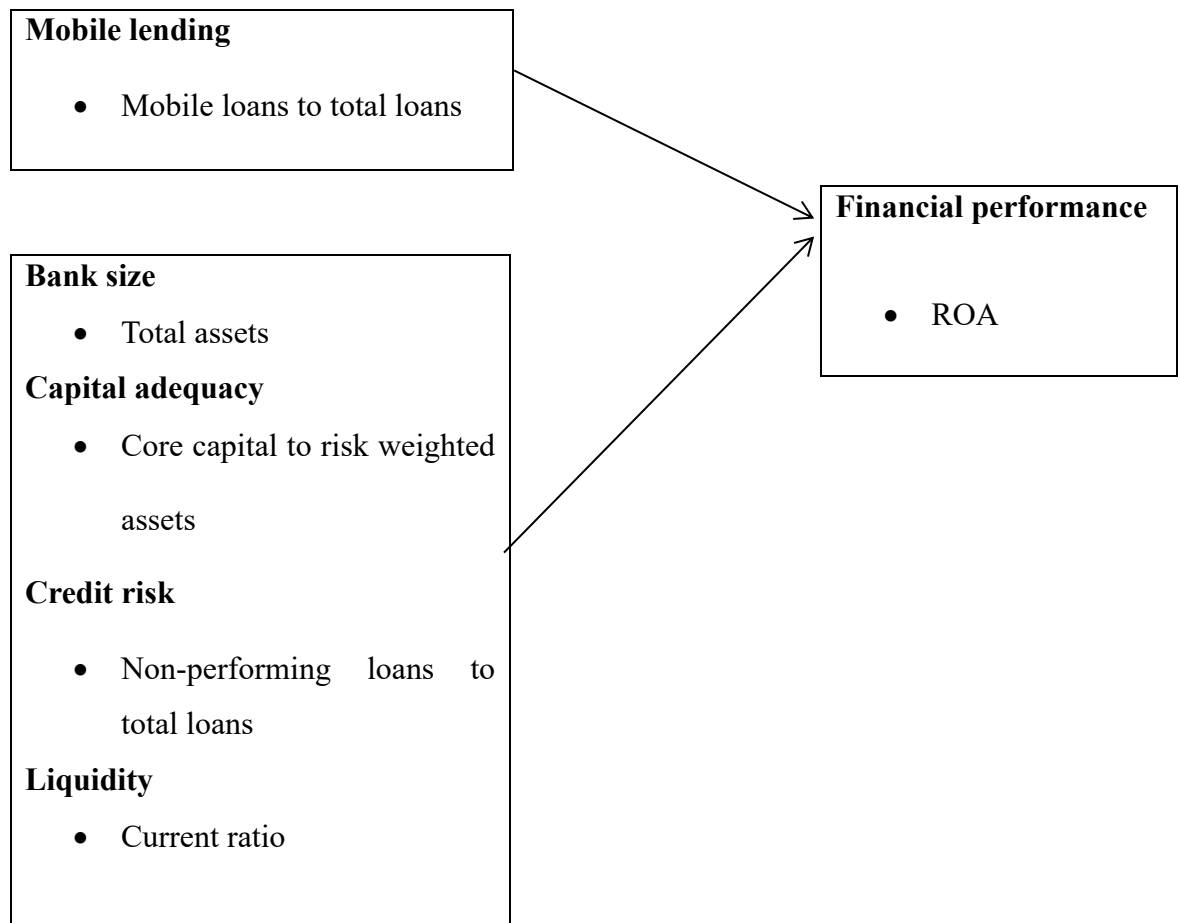
The model developed below portrays the expected association existing between the variables. The predictor variable was mobile lending given as the ratio of mobile lending to total loans per year. The control variable was credit risk given by the ratio of NPL to total loans, liquidity as measured liquid assets divided by customer deposits,

bank size given as the natural log of total assets and capital adequacy given as a ratio of core capital to total customer deposits. The dependent variable was the FP measured by ROA.

Figure 2.1: The Conceptual Model

Independent variable

Dependent variable



Control Variables

Source: Researcher (2019)

2.6 Summary of the Literature Review

A number of theoretical frameworks have explained the theoretically expected relationship between mobile lending and FP of banks. The theories covered in this review are; financial intermediation theory, technology acceptance model and diffusion

of innovation theory. Some of the primary influencers of FP have also been explored in this chapter. A number of local and international empirical studies have been carried out on mobile lending and FP of banks. The findings of these studies have also been explored in this section.

The lack of consensus among international and local studies on the impact of mobile lending on FP of banks is an enough reason to conduct further studies. The reviewed studies in the Kenyan context have either failed to show how the Kenyan bank's FP is affected by mobile lending or consider a different measure of mobile lending. This research gap is what this study sought to fill.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

In order to establish the alignment between the study variables, a research methodology is necessary to outline how the research was carried out. This section detailed the research design, population to be selected in this study. Data collection, data analysis

and presentation techniques that were employed in the study are also expounded in this section.

3.2 Research Design

Descriptive cross sectional research design was embraced in this study. The design was utilized as the researcher is interested in finding out the state of affairs as they exist (Khan, 2008). The fact that the researcher of this study has insight on the area under examination but seeks more knowledge regarding the relationship between the variable being studied make this research design suitable. In addition, a descriptive research aims at providing a valid and accurate representation of the study variables and this helps in responding to the research question (Cooper & Schindler, 2008).

3.3 Population

This study's population was the 42 commercial banks that operated in Kenya as at 31st December 2018. Since the population is finite, a survey of the 42 banks was undertaken for the study (see appendix I).

3.4 Data Collection

The source of the secondary data was the published annual financial reports published by banks operating in Kenya between January 2014 and December 2018 and captured in a data collection sheet. The reports will be obtained from the CBK web page and banks annual reports. The end result was annual information concerning the predictor variables and the response variable for the 42 commercial banks in Kenya.

3.5 Diagnostic Tests

The study undertook several diagnostics test to assess the applicability of the research structure. The study first assessed for normality which through the Kolmogorov-Smirnov and Shapiro-Wilk tests of the residuals where in both tests, a non-important result (a p factor of greater than 5%) was deemed an indication for normality. Stationarity test is a process where the statistical properties such as mean, variance and autocorrelation structure do not change with time. Stationarity was obtained from the run sequence plot. The study also assessed for multicollinearity using the tolerance and the variance inflation factors (VIF) where a tolerance figure of greater than 0.2 or a VIF or more than 10 will be indication of the presence of multicollinearity. Additionally, the study also assessed for heteroskedasticity using the Breusch-Pagan / Cook-Weisberg test and the plotting of residual graphs and assess for serial correlation (autocorrelation) using the Durbin Watson test where a value of between 1.5 and 2.5 indicated that there exists no auto-correlation.

3.6 Data Analysis

The SPSS software version 22 was used in the analysis of the data. The researcher quantitatively presented the findings using graphs and tables. Descriptive statistics were employed for summarizing and explaining the study variables that were observed in banks. The results were presented by use of percentages, frequencies, measures of central tendencies and dispersion displayed in tables. Inferential statistics included Pearson correlation, ANOVA, multiple regressions and coefficient of determination.

3.6.1 Analytical Model

The model below was used:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \varepsilon.$$

Where: Y = Financial performance of commercial banks given by ROA per annum

α = y regression intercept.

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ = regression slope

X_1 = Mobile lending given by the ratio of mobile loans to total loans per year

X_2 = Capital adequacy given by the ratio of core capital to risk weighted assets per year

X_3 = Bank size given by the natural logarithm of total assets on an annual basis

X_4 = Credit risk given by the ratio of non-performing loans to total gross loans and advances per year

X_5 = Bank liquidity given as ratio of liquid assets to customer deposits on an annual basis

ε = error term

3.6.2 Tests of Significance

Parametric tests were carried out by the researcher to establish the statistical significance of both the overall model and individual parameters. The F-test was used in the determination of the significance of the overall model and it was obtained from Analysis of Variance (ANOVA) while a t-test was used to establish statistical significance of individual variables.

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This section details the analysis, findings and elucidation of the secondary data obtained from the CBK and individual banks websites. The aim of the study was determining the effect of mobile lending on the FP of commercial banks in Kenya. The independent variable for the study was mobile lending while the dependent variable was the FP measured by ROA. Regression analysis was adopted to determine the effect between the variables of study in relation to the study's objectives. In ascertaining the suitability of the analytical model, ANOVA was applied. The results were presented in tables and figures.

4.2 Descriptive Analysis

The statistics produces a representation of the mean, minimum and maximum values of variables presented including the standard deviations. Table 4.1 below displays the qualities of each variable. An output of each variable was extracted using SPSS software for a five-year time frame (2014 to 2018) on an annual basis.

Table 4.1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
ROA	165	-.2440	.0500	.009952	.0375373
Mobile lending	165	.0052	.2947	.084249	.0658190
Capital adequacy	165	-.2201	1.9617	.236281	.2138279
Liquidity	165	.0450	1.7430	.796912	.2322102
Credit risk	165	.0000	.7196	.108583	.1141382
Bank size	165	14.7750	20.3870	17.859442	1.3266661
Valid N (listwise)	165				

Source: Research Findings (2019)

4.3 Diagnostic Tests

The data collected was subjected to diagnostic tests. The study presumed a significance level of 5% or 95% confidence interval so as to make variable deductions on the data adopted. Diagnostic tests were useful for ascertaining the falsity or truth of the data. Therefore, the nearer to 100% the confidence interval, the more accurate the data used is presumed to be. In this case, the tests conducted were Multicollinearity test, normality test, and autocorrelation and Heteroskedasticity tests.

4.3.1 Multicollinearity Test

Multicollinearity can be defined as a statistical state where more than one predictors are highly correlated in a multiple regression model. It is an unwanted situation for independent variables to have a strong correlation. A combination of variables is said to exhibit high Multicollinearity in case there is one or more exact linear correlation among the study variables.

Table 4.2: Multicollinearity Test

Variable	Collinearity Statistics
	VIF
Mobile lending	2.732
Capital Adequacy	2.513
Liquidity	2.577
Credit risk	2.717
Bank size	2.659

Source: Research Findings (2019)

VIF value of the variable was utilized where the values below 10 for VIF imply no Multicollinearity. From the results, all the variables had a VIF values <10 as illustrated in table 4.2 suggesting that no Multicollinearity.

4.3.2 Normality Test

Shapiro-wilk test and Kolmogorov-Smirnov test were utilized for normality testing. The level of significance in the study was 5%. The outputs of the test are depicted in Table 4.3. The null hypothesis is that the data is distributed normally. Since the p value in both tests of all the variables is greater than the α (0.05), then the null hypothesis is not rejected. Hence the data series of all the variables is normally distributed.

Table 4.3: Normality Test

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
ROA						
Mobile lending	.173	165	.300	.918	165	.822
Capital Adequacy	.180	165	.300	.894	165	.790
Liquidity	.176	165	.300	.892	165	.784
Credit risk	.178	165	.300	.893	165	.787
Bank size	.181	165	.300	.896	165	.792

a. Lilliefors Significance Correction

Source: Research Findings (2019)

4.3.3 Autocorrelation Test

To test for autocorrelation, Durbin-Watson statistic was applied which gave an output of 2.098 as displayed in Table 4.4. The Durbin-Watson statistic ranges from point 0 and point 4. If there exist no correlation between variables a value of 2 is shown. If the values fall under point 0 up to a point less than 2, this is an indication of an autocorrelation and on the contrast a negative autocorrelation exist if the value falls under point more than 2 up to 4. As a common rule in statistics, values falling under the range 1.5 to 2.5 are considered relatively normal whereas values that fall out of the

range raise a concern. Field (2009) however, opines that values above 3 and less than 1 are a sure reason for concern. Therefore, the data used in this panel is not serially autocorrelated since it meets this threshold.

Table 4.4: Autocorrelation Test

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.634 ^a	.402	.383	.0294807	2.098

a. Predictors: (Constant), Bank size, Liquidity, Mobile lending, Capital adequacy, Credit risk
b. Dependent Variable: ROA

Source: Research Findings (2019)

4.3.4 Heteroskedasticity Test

The study checked for heteroskedasticity by use of Likelihood Ratio (LR) as indicated in the Table. This test used the alternative hypothesis that the error was homoscedastic. A chi-square value of 32.24 was produced by the likelihood-ratio test with a 0.0000 p-value. The chi-square esteem was significant at 1 percent level ,in this manner the invalid speculation of consistent fluctuation was rejected meaning the nearness of heteroskedasticity in the examination information as suggested by Poi and Wiggins (2001). To deal with this issue the examination utilized the FGLS estimation method.

Table 4.5: Heteroskedasticity Test

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of ROA

chi2(1) = 32.24

Prob > chi2 = 0.0000

Source: Research Findings (2019)

4.4 Correlation Analysis

Correlation analysis establishes whether there exists an association among two variables. The association falls between a perfect positive and a strong negative correlation. This study utilized Pearson correlation to analyze the level of association between ROA and mobile lending. The study employed a confidence interval of 95%, as it is the most utilized in social sciences. A two tailed test was utilized. Table 4.6 shows the correlation analysis outcome.

Existence of a positive but not statistically substantial correlation ($r = .138$, $p = .076$) between mobile lending and FP was revealed. Further results discovered a positive and significant correlation between bank size and banks' performance as demonstrated by ($r = .513$, $p = .000$) existed. Credit risk was also noted to have a negative and significant association with performance as evidenced by ($r = -.380$, $p = .005$). Capital adequacy and liquidity exhibited a positive relationship with FP but the association was not statistically substantial as evidenced by p values above 0.05. The study further found that although there was an association between the independent variables, it was not strong enough to result to Multicollinearity. In statistics, multicollinearity is a situation where there is existence of a perfect relationship between the predictor variables. Existence of an exact or a perfect among the predictor variables makes it challenging to derive dependable estimations of individual coefficients. Thus, it leads to improper conclusions of the relationships among the predictor and the response variables.

Table 4.6: Correlation Analysis

		ROA	Mobile lending	Capital adequacy	Liquidity	Credit risk	Bank size
ROA	Pearson Correlation	1					
	Sig. (2-tailed)						
Mobile lending	Pearson Correlation	.138	1				
	Sig. (2-tailed)	.076					
Capital adequacy	Pearson Correlation	.098	.011	1			
	Sig. (2-tailed)	.212	.887				
Liquidity	Pearson Correlation	.096	.072	.216**	1		
	Sig. (2-tailed)	.218	.358	.005			
Credit risk	Pearson Correlation	-.380**	-.136	-.186*	-.060	1	
	Sig. (2-tailed)	.000	.082	.017	.444		
Bank size	Pearson Correlation	.513**	.124	.089	.052	-.296**	1
	Sig. (2-tailed)	.000	.113	.254	.511	.000	

** . Correlation is significant at the 0.01 level (2-tailed).
* . Correlation is significant at the 0.05 level (2-tailed).
c. Listwise N=165

Source: Research Findings (2019)**4.5 Regression Analysis**

At significance level of 5% a regression analysis was accomplished between FP and the five predictor variables selected for this study. The F critical value was compared against the F calculated.

Table 4.7: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.634 ^a	.402	.383	.0294807	2.098

a. Predictors: (Constant), Bank size, Liquidity, Mobile lending, Capital adequacy, Credit risk
b. Dependent Variable: ROA

Source: Research Findings (2019)

From table 4.7, the R-square value was 0.402, implying that 40.2 % of the deviations in FP of commercial banks is caused by changes in mobile lending, capital adequacy,

liquidity, credit risk and bank size. Other factors not incorporated in the model are attributed to 59.8% of the changes in FP. The correlation coefficient (R) value of 0.634 shows that there exists a strong relationship between the independent variables included in the study and FP.

Table 4.8 provides the outcomes of the ANOVA; the essence of F-test was to establish how significant model. A critical value of 2.24 was obtained from the F-Test tables. The F statistic indicated in the study findings is more than the critical value, thus the whole model is significant to predict FP.

Table 4.8: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.093	5	.019	21.377	.000 ^b
	Residual	.138	159	.001		
	Total	.231	164			

a. Dependent Variable: ROA
b. Predictors: (Constant), Bank size, Liquidity, Mobile lending, Capital adequacy, Credit risk

Source: Research Findings (2019)

So as to ascertain the significance of each variable individually variable in this research as a predictor of the performance of banks it was important for t-test to be employed. P-value was utilized to indicate how significant the relationship between the response and the predictor variables was. Confidence level at 95% and value of p below 0.05 was understood as an index of statistical significance of the concepts. Therefore, a p-value more than 0.05 depicts an insignificant the variables. The outcomes are demonstrated in table 4.9.

Table 4.9: Model Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	-.244	.037		-6.660	.000
Mobile lending	.137	.036	.241	3.864	.000
Capital adequacy	.023	.011	.128	1.970	.051
Liquidity	.025	.010	.153	2.399	.018
Credit risk	-.077	.022	-.234	-3.507	.001
Bank size	.014	.002	.492	7.496	.000

a. Dependent Variable: ROA

Source: Research Findings (2019)

The coefficients are used as an indicator of the magnitude and direction of the relation between the predictors and the response variable. The T values were applied to establish how significant the relationship of the predictor variable to the response variable was. The values obtained are contrasted to the critical values. A confidence interval of 95% and a two tailed T test critical value of ± 2.04523 was obtained from the T test tables. A T test value that lies out of this range is significant.

The results revealed that mobile lending, liquidity and bank size have positive and significant influence on FP. Implication of this is that a unit increment in either mobile lending, liquidity or bank size will result to an increment in financial performance by 0.137, 0.025 and 0.014 respectively. The findings further showed that credit risk has a substantial negative effect on FP implying that a unit increment in credit risk will lower FP by -0.077. Although capital adequacy had a positive influence on FP, the influence was not statistically significant. The constant coefficient -0.244 implies that when the five selected independent variable have a zero value, financial performance would be equal to the figure.

The regression equation below was thus estimated:

$$Y_i = -0.244 + 0.137X_1 + 0.025X_2 - 0.077X_3 + 0.014X_4$$

Where;

Y_i = Return on Assets

X_1 = Mobile lending

X_2 = Liquidity

X_3 = Credit risk

X_4 = Bank size

4.6 Discussion and Interpretation of Research Findings

The researcher was seeking to assess the influence of mobile lending on the commercial banks' FP. Mobile lending, capital adequacy, liquidity, credit risk and bank size were the predictor variables in this study while financial performance of commercial banks given by ROA was the response variable. The adequacy of the overall model in predicting FP was examined. The influence of each predictor variable on the dependent variable was also examined with respect to strength and direction.

From the results of Pearson correlation, a positive but not statistically notable correlation between mobile lending and financial performance was found to exist. Further a positive and significant correlation between bank size and commercial banks' performance existed. Credit risk was also noted to have a negative and significant association with performance. Liquidity and capital adequacy were found to have a positive but insignificant link with FP.

The independent variables from the model summary revealed that: Mobile lending,

capital adequacy, liquidity, credit risk and bank size explains 40.2% of variations in the response variable as shown by R square which derives an implication that other factors not considered in the model explain the 59.8% of variations in performance. The model was found fit at 95% confidence level because the F-value is 21.377. This signifies that the model adopted is appropriate for predicting and explaining how the independent variables affect commercial banks' FP. This implies that mobile lending, capital adequacy, liquidity, credit risk and bank size are good predictors of financial performance.

This study agrees with Ndagijimana (2017) who sought to determine the effect of mobile lending on FP of commercial banks in Kenya. Descriptive design was applied in the study while all banks were included in the study. Tertiary data was obtained from banks annual reports and analyzed using both inferential and descriptive statistics to establish explanatory power of the selected independent variables. The study concludes that mobile lending positively and significantly affects the FP of banks in Kenya.

The study agrees with one done by Kinyanzui, Kiriri and Achoki (2018) who undertook a research to investigate on the impact of mobile credit on the operational efficiency of Kenyan banks using a mix of both primary and secondary data on credit accessibility and its effect on enterprises performance. A questionnaire with a mix of open ended and closed ended questions was used in collection of data. The multiple linear regression method was embraced in undertaking data analysis. The study measured operational efficiency in terms of earnings per share, ROA and the proportion of non-performing loans. Mobile credit was measured in terms of enterprises being able to use mobile phones to undertake transactions such as make payments, collect loan

repayments and make disbursements to shareholders. The study findings indicated that the proportion of non-performing loans decreased after mobile credit introduction an indication that debt collection operational efficiency had improved. Mobile credit introduction improved operational efficiency of enterprises in that brand image, the ability to adapt to changes in the market as well as improved perception of reliability in customer's minds.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The main goal of the study was determining how mobile lending on the performance of Kenyan banks. This section gives a detailed review of the results from the previous chapter, conclusion, limitations encountered during the study. Moreover, it recommends policies that policy makers can use. Additionally, the chapter gives recommendations for future researchers.

5.2 Summary of Findings

The aim was to ascertain how mobile lending influences FP of banks in Kenya. To conduct the study, mobile lending was given by the ratio of mobile loans to total loans on an annual basis. The control variables were capital adequacy as given by the ratio of core capital to risk weighted assets, liquidity as measured liquid assets divided by customer deposits, credit risk given as the ratio of non-performing loans to total loans and bank size given as the natural log of total assets. FP was the response variable that formed the scope of the study and it was given by return on assets. The researcher reviewed available theoretical foundations and empirical reviews to get an understanding on the generally accepted relationship among the selected dependent and independent variables. From this review, a conceptual framework was developed that hypothesized the expected association between the study variables.

Descriptive research design was employed. All the 42 commercial banks as at December 2018-year end comprised the population of this study and from this data was

obtained from 33 banks giving a response rate of 78.57%. Data secondary in nature was acquired from CBK and individual banks financial reports for a time frame 5 years spanning 2014 to 2018 was used. The researcher carried out descriptive, correlation analysis as well as regression analysis. So as to confirm that the data is fit for analysis the researcher transformed the data using natural logarithms and conducted diagnostic tests to make sure that the data has the required characteristics before conducting inferential statistics. Regression analysis was applied in testing the strength of the association between the study variables and to test both the significance of the overall model and individual parameters. SPSS software version 22 was used to carry out the analysis.

Pearson correlation showed that mobile lending and FP were positively but not notably correlated. Further a positive and significant correlation between bank size and commercial banks' performance existed. Credit risk was noted to have a negative and significant association with performance. Liquidity and capital adequacy were found to have a positive but insignificant link with performance.

The coefficient of determination also called R square shows the disparities in the response variable triggered by variations from the predictor variable. From the results, R square was found to be 0.402, a revelation that 40.2% of the changes in performance stems from variations in mobile lending, capital adequacy, liquidity, credit risk and bank size. Alternative factors beyond those in the model justify for 59.8% of these changes in financial performance. The findings showed a strong correlation between the chosen variables and the FP of banks ($R=0.634$). Results from the ANOVA test showed that the F statistic was at significance level of 5% and a $p=0.000$ rendering the

model appropriate for providing an explanation of the relation between the variables studied.

The study further found that an increment in a unit in mobile lending, liquidity or bank size will result to an increment in financial performance by 0.137, 0.025 and 0.014 respectively. The findings further revealed that credit risk has a significant negative effect on FP implying that a unit increment in credit risk will lower FP by -0.077. Although capital adequacy had a positive influence on financial performance, the influence was not statistically significant. The constant coefficient -0.244 implies that when the five selected independent variable have a zero value, financial performance would be equal to the figure.

5.3 Conclusion

The findings of this study show that the FP of Kenyan banks is notably impacted by mobile lending, liquidity and bank size. This research shows that an increment in a unit in these variables significantly increases the FP of commercial banks. The study further revealed that credit risk has a significant negative effect on FP of banks in Kenya. The study also showed that capital adequacy is statistically insignificant in determining performance and hence the study concluded that this variable does not have a profound effect on performance.

The conclusion of this study is that the predictor variables selected for this study (mobile lending, capital adequacy, liquidity, credit risk and bank size) to a larger extent have a notable influence on bank performance in Kenya. The conclusion that these variables have a notable impact on the performance of banks given the p value in anova summary is hence correct. The finding that 40.2% of the variations in the response

variable are from the four factors listed implies that the 59.8% variations result from other factors outside the model.

This study agrees with the findings of Ndagijimana (2017) who sought to determine the effect of mobile lending on FP of commercial banks in Kenya. Descriptive design was applied in the study while all banks were included in the study. Tertiary data was obtained from banks annual reports and analyzed using both inferential and descriptive statistics to establish explanatory power of the selected independent variables. The study concludes that mobile lending positively and significantly affects the FP of banks in Kenya.

This study diverges with Kamande (2018) who studied how electronic banking impacts FP of commercial banks in Kenya. He sampled all of the 42 commercial banks operating in Kenya. The predictor variable was selected as electronic banking as measured by value of transactions carried out through mobile banking, internet banking, agency banking and ATMs. FP was selected as the response variable of the study and it was given by the ROA. Secondary data for 5 years was collected beginning January 2013 up to December 2017. The results revealed that agency banking, ATMs, capital adequacy, liquidity and bank size had both a positive and significant effect on this study. It was also revealed that mobile banking and internet banking are statistically insignificant determinants of FP of banks. This study failed to take into account the effect of online banking on efficiency of banks in Kenya.

5.4 Recommendations of the Study

Leveraging on the study findings, below recommendations have been drawn. The study recognized that a positive and significant influence of mobile lending on FP of banks

exists. Thus, the study findings were that an increase in a bank's mobile lending will significantly influence financial performance. It is recommended that policy makers should prioritize mobile lending when crafting policies to enhance ROA. It can also be recommended to financial institutions, and their boards that investing in electronic banking and specifically mobile loans should be considered when carrying out strategic management practices to boost performance.

The study showed that FP showed a positive impact with the size of the bank. A recommendation is that banks' management and directors should focus on increasing their asset base by formulating measures and policies centered on enlarging the banks' assets since this has a direct impact on how they perform financially. The results of the study show that the larger the bank (in terms of asset base), the higher the expectation of superior performance in comparison to smaller banks and hence more focus should be on growing their asset base.

A positive relationship between FP and liquidity position was found to exist in this study. This study therefore recommends that a comprehensive assessment of banks' immediate liquidity position should be undertaken to ensure the banks are operating at sufficient levels of liquidity that will lead to improved performance. This is because a firm's liquidity position is of high significance since it influences the firm's current operations.

5.5 Limitations of the Study

The study was confronted with limitations including; the data used was secondary in nature and the researcher is not aware of its authenticity and reliability based on its collection and storage and alterations that might have been done on it.

The study adopted the analytical approach which is highly scientific. The research also disregarded qualitative information which could explain other factors that influence the association between mobile lending and banks' performance. The study should have rather considered utilizing focus group discussions, open ended questionnaires or interviews so as to come up with more concrete results.

The research concentrated on 5 years (2014 to 2018). It is not certain whether the findings would hold for a longer time frame. It is also unclear as to whether similar outcomes would be obtained beyond 2018. The study should have been executed over a longer time frame in order to incorporate major forces such as booms and recession.

This study focused on some factors that are hypothesized to influence FP of banks in Kenya. Specifically, the study focused on five explanatory variables. In reality however, there are other variables that are likely to influence FP some which are internal such as management efficiency and leverage while others are not under the control of management such as interest rates, exchange rates, balance of trade, and unemployment rate among others.

To complete the analysis of the data, multiple linear regression model was used. Because of the limitations involved when using the model like erroneous and misleading results resulting from a change in variable value, it would be impossible for the researcher to generalize the findings with accuracy. In case of an addition of data to the regression model, the model may not perform as per the previous.

5.6 Suggestions for Further Research

A suggestion is given that more research ought to include a qualitative analysis on how mobile lending and FP of banks in Kenya relate. That study would deal with

interviewing of vital respondents in the banks and this would reveal concealed insights into the fine detailed relationship between mobile lending and FP of listed banks.

The study didn't exhaust all the independent variables influencing performance of Kenyan commercial banks and a recommendation is given that more studies be carried out to constitute other variables for instance ownership structures, industry practices, growth opportunities, political stability and age of the firm. Determining the impact of each variable on financial performance shall enable the policy makers to understand the tools that can be used to control performance.

The research only focused on the commercial banks. The study's recommendations are that further studies be carried out on other financial institutions in Kenya. Future studies can also focus on how mobile lending influences other aspects other than FP such as credit accessibility by those excluded from traditional banking, poverty eradication and overall economic growth.

The attention of this study was drawn to the latest five years because it was the readily available information. Subsequent studies may cover big time frame like ten or twenty years which can be very impactful on this study by either complementing or disregarding the findings of this study. The advantage of a longer study is that it will enable the researcher to capture effects of business cycles such as booms and recessions.

Finally, this study was based on a multiple linear regression model, which have its own limitations such as erroneous and misleading results resulting from a change in variable value. Future researchers should focus on other models such as the Vector Error

Correction Model (VECM) in exploring the various relations between selected macro-economic variables and stock market volatility.

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APPENDICES

Appendix I: List of Commercial Banks in Kenya as at 31st December 2018

1. ABC Bank (Kenya)
2. Bank of Africa
3. Bank of Baroda
4. Bank of India
5. Barclays Bank of Kenya
6. Chase Bank Kenya (In Receivership)
7. Citibank
8. Commercial Bank of Africa
9. Consolidated Bank of Kenya
10. Cooperative Bank of Kenya
11. Credit Bank
12. Development Bank of Kenya
13. Diamond Trust Bank
14. Dubai Islamic Bank
15. Ecobank Kenya
16. Equity Bank
17. Family Bank
18. First Community Bank
19. Guaranty Trust Bank Kenya
20. Guardian Bank
21. Gulf African Bank
22. Habib Bank AG Zurich
23. Housing Finance Company of Kenya
24. I&M Bank
25. Imperial Bank Kenya (In receivership)
26. Jamii Bora Bank
27. Kenya Commercial Bank
28. Mayfair Bank
29. Middle East Bank Kenya

30. National Bank of Kenya
31. NIC Bank
32. Oriental Commercial Bank
33. Paramount Universal Bank
34. Prime Bank (Kenya)
35. SBM Bank Kenya Limited
36. Sidian Bank
37. Spire Bank
38. Stanbic Bank Kenya
39. Standard Chartered Kenya
40. Trans National Bank Kenya
41. United Bank for Africa
42. Victoria Commercial Bank

Source: CBK (2019)

Appendix II: Research Data

Bank	Year	ROA	Mobile lending	Capital adequacy	Liquidit y	Credit risk	Bank size
ABC Bank	2014	0.0070	0.1003	0.1723	0.8514	0.0507	16.9100
	2015	0.0080	0.1247	0.1645	0.9676	0.1426	16.9340
	2016	0.0030	0.1805	0.1528	0.8750	0.1566	16.9450
	2017	0.0060	0.1993	0.1560	0.7638	0.1829	17.0580
	2018	0.0000	0.1003	0.1844	0.7855	0.1989	17.1450
Bank of Africa	2014	0.0020	0.1247	0.1592	0.8776	0.0475	18.1600
	2015	-0.0150	0.1805	0.1639	0.7960	0.2325	18.0540
	2016	0.0000	0.1993	0.1616	0.9152	0.2606	17.8410
	2017	0.0010	0.2002	0.1578	0.8675	0.2816	17.8080
	2018	0.0040	0.0597	0.1602	0.7034	0.3383	17.7090
Bank of Baroda	2014	0.0360	0.0489	1.8796	0.4417	0.0440	17.9420
	2015	0.0300	0.0293	1.9617	0.5362	0.0754	18.0380
	2016	0.0360	0.0616	0.3053	1.0000	0.0846	18.2330
	2017	0.0410	0.0592	0.3229	1.0000	0.0586	18.3810
	2018	0.0320	0.0489	0.3466	0.8940	0.0987	18.6280
Barclays Bank	2014	0.0370	0.0293	0.1596	0.7624	0.0363	19.2350
	2015	0.0350	0.0616	0.1840	0.8834	0.0054	19.3000
	2016	0.0280	0.0592	0.1786	0.9457	0.0095	19.3750
	2017	0.0260	0.1996	0.1803	0.9055	0.0114	19.4200
	2018	0.0230	0.2134	0.1638	0.8551	0.0184	19.6000
Bank of India	2014	0.0300	0.2392	0.3941	0.5017	0.0056	17.3530

Bank	Year	ROA	Mobile lending	Capital adequacy	Liquidity	Credit risk	Bank size
	2015	0.0260	0.2525	0.4230	0.7255	0.0202	17.5570
	2016	0.0340	0.2298	0.4574	0.7201	0.0139	17.6830
	2017	0.0370	0.0576	0.5397	0.6598	0.0207	17.8520
	2018	0.0310	0.0458	0.4392	0.0450	0.7196	17.9540
Citibank	2014	0.0310	0.0562	0.2730	0.4694	0.0238	18.1900
	2015	0.0390	0.0484	0.2832	0.4293	0.0580	18.2950
	2016	0.0330	0.0456	0.2637	0.4391	0.0192	18.4530
	2017	0.0400	0.0643	0.2555	0.5777	0.0368	18.4030
	2018	0.0370	0.0790	0.2764	0.4825	0.0162	18.2660
Commercial Bank of Africa	2014	0.0170	0.2578	0.1791	0.6449	0.0708	19.1010
	2015	0.0170	0.2351	0.1792	0.6294	0.1059	19.1890
	2016	0.0290	0.2815	0.1845	0.6305	0.0745	19.2510
	2017	0.0230	0.0841	0.1732	0.5865	0.0831	19.3200
	2018	0.0230	0.0945	0.1573	0.6183	0.0797	19.3170
Consolidated bank	2014	-0.0190	0.0743	0.1099	0.8657	0.1195	16.5290
	2015	0.0030	0.0836	0.0939	0.9225	0.0553	16.4640
	2016	-0.0150	0.0835	0.0790	0.9652	0.1176	16.4490
	2017	-0.0250	0.1511	0.0509	0.9740	0.1527	16.4150
	2018	-0.0420	0.0130	0.0280	0.9815	0.1533	16.3720
Co-operative bank of Kenya	2014	0.0280	0.0571	0.2165	0.8245	0.0188	19.4690

Bank	Year	ROA	Mobile lending	Capital adequacy	Liquidity	Credit risk	Bank size
	2015	0.0340	0.0507	0.2126	0.7859	0.0158	19.6520
	2016	0.0360	0.2123	0.2277	1.0026	0.0224	19.6790
	2017	0.0290	0.0393	0.0227	1.0063	0.0346	19.7740
	2018	0.0310	0.0700	0.1618	0.8017	0.0414	19.8410
Development Bank of Kenya	2014	0.0029	0.0762	0.2345	1.3340	0.2699	16.2450
	2015	0.0036	0.0734	0.2442	1.4480	0.2632	16.1850
	2016	0.0040	0.0686	0.2508	1.5140	0.2601	16.6130
	2017	0.0020	0.2129	0.2355	1.4772	0.2098	16.6070
	2018	0.0036	0.1910	0.2456	1.7430	0.2079	16.8050
Diamond Trust Bank	2014	0.0270	0.2224	0.2291	0.8552	0.0116	19.1700
	2015	0.0240	0.2363	0.1463	0.9149	0.0241	19.4200
	2016	0.0240	0.2528	0.1850	0.7824	0.0325	19.6090
	2017	0.0190	0.0932	0.1901	0.7363	0.0666	19.7110
	2018	0.0190	0.0971	0.2111	0.6826	0.0629	19.7500
Dubai bank	2014	0.0260	0.0783	0.4230	0.7255	0.0033	17.5570
	2015	0.0340	0.0693	0.4574	0.7201	0.0077	17.6830
	2016	0.0370	0.0526	0.5397	0.6598	0.0046	17.8520
	2017	-0.2300	0.2769	0.7005	0.2460	0.0000	14.7750
	2018	-0.1660	0.2947	0.2990	0.6666	0.0037	15.4740
Ecobank	2014	-0.0070	0.0409	0.3184	0.7090	0.0871	17.6430
	2015	0.0020	0.0415	0.2496	0.8591	0.0622	17.7750

Bank	Year	ROA	Mobile lending	Capital adequacy	Liquidity	Credit risk	Bank size
	2016	- 0.043 0	0.0394	0.1944	0.7590	0.1628	17.6680
	2017	- 0.021 0	0.0053	0.1599	0.3747	0.3770	17.7940
	2018	0.001 0	0.0052	0.1659	0.2910	0.1735	17.8130
Equity Bank	2014	0.050 0	0.0204	0.2120	0.8728	0.0343	19.6580
	2015	0.040 0	0.0094	0.2017	0.8932	0.0272	19.8750
	2016	0.035 0	0.0228	0.1966	0.7891	0.0628	19.9760
	2017	0.036 0	0.0403	0.2041	0.7479	0.0553	20.0780
	2018	0.035 0	0.0465	0.2041	0.7031	0.0487	20.1670
Family bank	2014	0.029 0	0.0477	0.2691	1.1849	0.0195	17.9400
	2015	0.024 0	0.0458	0.1441	0.6048	0.0367	18.2130
	2016	0.005 0	0.0486	0.2078	1.2118	0.1197	18.0570
	2017	- 0.014 0	0.0142	0.1986	0.9179	0.1923	18.0520
	2018	0.004 0	0.0118	0.1952	0.9099	0.1618	18.0200
First Community Bank	2014	0.003 0	0.0249	0.1125	0.7321	0.1506	16.5420
	2015	- 0.001 0	0.0310	0.1145	0.8858	0.2346	16.4940
	2016	- 0.004 0	0.0211	0.1399	0.8644	0.3195	16.5210
	2017	0.009 0	0.0656	0.1534	0.6584	0.4078	16.6700
	2018	- 0.012 0	0.0742	0.0911	0.6175	0.4882	16.6990
Guaranty Trust Bank	2014	0.010 0	0.1321	0.2335	0.6570	0.1296	17.6340

Bank	Year	ROA	Mobile lending	Capital adequacy	Liquidit y	Credit risk	Bank size
	2015	0.0090	0.0906	0.2649	0.7435	0.0916	17.5280
	2016	0.0130	0.0726	0.2547	0.7150	0.1108	17.2860
	2017	0.0070	0.0445	0.2387	0.7444	0.1088	17.2770
	2018	0.0020	0.0502	0.2597	0.6861	0.1467	17.4520
Guardian Bank	2014	0.0180	0.0367	0.1712	0.7463	0.0126	16.4950
	2015	0.0160	0.0518	0.1763	0.7398	0.0304	16.4970
	2016	0.0160	0.0572	0.1904	0.7289	0.0169	16.5040
	2017	0.0100	0.0659	0.2022	0.7331	0.0453	16.5760
	2018	0.0140	0.0613	0.2275	0.6771	0.0494	16.6000
Gulf African Bank	2014	0.0200	0.0856	0.1351	0.8734	0.0650	16.7990
	2015	0.0290	0.0816	0.1577	0.8113	0.0842	17.0230
	2016	0.0180	0.0934	0.1872	0.7443	0.0923	17.1170
	2017	0.0050	0.0681	0.1620	0.7434	0.0929	17.2600
	2018	0.0040	0.0694	0.1866	0.8470	0.0000	17.3220
Habib Bank Ltd	2014	0.0100	0.0733	0.2022	0.7331	0.0753	16.5760
	2015	0.0290	0.0768	0.3213	0.5751	0.0792	16.1410
	2016	0.0240	0.0749	0.3911	0.4641	0.1871	16.3420
	2017	0.0020	0.0873	0.1700	1.3509	0.1799	18.0280
	2018	-0.0100	0.0904	0.1534	1.2511	0.1783	17.9190
I&M Bank	2014	0.0320	0.0436	0.1885	0.9850	0.0099	18.9890
	2015	0.0370	0.0412	0.2020	0.9612	0.0248	19.0720
	2016	0.0370	0.0664	0.1815	0.9192	0.0289	19.1650

Bank	Year	ROA	Mobile lending	Capital adequacy	Liquidit y	Credit risk	Bank size
	2017	0.030 0	0.0278	0.1858	0.9039	0.0870	19.2970
	2018	0.029 0	0.0943	0.1793	0.7823	0.0773	19.4800
KCB Bank	2014	0.034 0	0.1805	0.2101	0.7521	0.0313	20.0110
	2015	0.035 0	0.1993	0.1536	0.8152	0.0446	20.1400
	2016	0.033 0	0.2002	0.1801	0.8607	0.0705	20.2040
	2017	0.030 0	0.1996	0.1663	0.8461	0.0766	20.2870
	2018	0.034 0	0.2134	0.1955	0.8482	0.0627	20.3870
National Bank of Kenya	2014	0.007 0	0.0521	0.1393	0.6267	0.1190	18.6280
	2015	- 0.009 0	0.0765	0.1399	0.6129	0.1116	18.6470
	2016	0.001 0	0.0386	0.0715	0.5861	0.1749	18.5350
	2017	0.007 0	0.0393	0.0542	0.5554	0.3001	18.5150
	2018	- 0.001 0	0.0700	0.0370	0.4833	0.3913	18.5590
NIC Plc bank	2014	0.028 0	0.0762	0.2104	1.0014	0.0134	18.7980
	2015	0.027 0	0.0734	0.2059	1.0204	0.0912	18.9260
	2016	0.026 0	0.0686	0.2304	1.0236	0.1126	18.9480
	2017	0.020 0	0.0932	0.2227	0.8621	0.1089	19.1440
	2018	0.020 0	0.0971	0.1869	0.8087	0.1224	19.1550
Paramount Bank Ltd	2014	0.014 0	0.0783	0.2545	0.5526	0.0661	16.1580
	2015	0.015 0	0.0693	0.2412	0.7279	0.0519	16.1690
	2016	0.011 0	0.0526	0.2741	0.7565	0.0828	16.0590
	2017	0.012 0	0.0053	0.2946	0.7639	0.1056	16.0710

Bank	Year	ROA	Mobile lending	Capital adequacy	Liquidity	Credit risk	Bank size
	2018	0.0240	0.0052	0.2853	0.6948	0.1318	16.1070
Prime Bank	2014	0.0320	0.0204	0.1676	0.7673	0.0134	17.8210
	2015	0.0310	0.0094	0.1729	0.8077	0.0170	17.9900
	2016	0.0290	0.0228	0.2216	0.7981	0.0362	17.9950
	2017	0.0290	0.0142	0.2248	0.6802	0.0486	18.1720
	2018	0.0230	0.0118	0.3729	0.5174	0.0606	18.4220
Sidian Bank	2014	0.0330	0.0249	0.2056	0.8664	0.0743	16.5760
	2015	0.0190	0.0310	0.2468	0.9357	0.1284	16.7660
	2016	0.0010	0.0211	0.2325	0.9817	0.2383	16.8540
	2017	-0.0220	0.0445	0.1646	0.8941	0.2780	16.7760
	2018	-0.0150	0.0502	0.1440	0.7753	0.2035	17.0470
Stanbic Bank Kenya Ltd	2014	0.0210	0.0367	0.1723	0.7652	0.0379	19.4870
	2015	0.0240	0.0518	0.1870	0.9881	0.0232	19.1550
	2016	0.0210	0.0572	0.1812	0.9687	0.0271	19.1850
	2017	0.0170	0.0681	0.1684	0.8440	0.0212	19.3320
	2018	0.0210	0.0694	0.1723	0.7652	0.0141	19.4870
Standard Chartered Bank	2014	0.0470	0.0733	0.1982	0.7967	0.0724	19.2200
	2015	0.0270	0.0768	0.2116	0.6692	0.1015	19.2710
	2016	0.0360	0.0749	0.2091	0.6576	0.0829	19.3390
	2017	0.0240	0.0436	0.1852	0.5920	0.0896	19.4710
	2018	0.0280	0.0412	0.1947	0.5290	0.1169	19.4690

Bank	Year	ROA	Mobile lending	Capital adequacy	Liquidity	Credit risk	Bank size
Spire Bank Ltd	2014	0.0200	0.0664	0.1071	0.7038	0.2508	16.6240
	2015	0.0340	0.0597	0.1745	0.8019	0.3332	16.4880
	2016	0.0540	0.0489	0.1627	0.8702	0.1677	16.4400
	2017	0.1010	0.0293	0.1265	0.7686	0.4271	16.2270
	2018	0.2440	0.0616	-0.2201	0.6667	0.5598	16.0370
Transnational Bank	2014	0.0120	0.0592	0.2773	0.7846	0.0881	16.1420
	2015	0.0160	0.0576	0.2164	0.8769	0.1103	16.1620
	2016	0.0110	0.0458	0.2230	0.7959	0.1156	16.1550
	2017	0.0040	0.0562	0.2908	0.8361	0.2416	16.1420
	2018	0.0070	0.0484	0.2111	0.8263	0.2696	16.1410
UBA Kenya Bank Ltd	2014	0.0590	0.0456	0.5862	0.2053	0.0630	15.3750
	2015	0.0340	0.0841	0.2379	0.6607	0.0180	15.8670
	2016	0.0040	0.0945	0.3868	1.5704	0.0186	15.5390
	2017	0.0030	0.0743	0.3878	1.0925	0.0436	15.6880
	2018	0.0030	0.0836	0.3316	0.5709	0.1276	16.5450
Victoria Commercial Bank	2014	0.0040	0.0835	0.2908	0.8361	0.0003	16.1420
	2015	0.0210	0.0919	0.1723	0.7652	0.0279	19.4870
	2016	0.0260	0.0948	0.2545	0.9743	0.0000	16.9250

Bank	Year	ROA	Mobile lending	Capital adequacy	Liquidit y	Credit risk	Bank size
	2017	0.0240	0.0571	0.2274	1.0103	0.0008	17.0730
	2018	0.0140	0.0507	0.2109	0.9504	0.0308	17.2920