EFFECT OF BANK FINANCIAL SOUNDNESS ON THE OPERATIONAL EFFICIENCY OF DEPOSIT TAKING MICROFINANCE BANKS IN KENYA

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A RESEARCH PROJECT PRESENTED IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF MASTERS OF SCIENCE IN FINANCE, SCHOOL OF BUSINESS, UNIVERSITY OF NAIROBI

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DECLARATION

This research project is my original work and has not been submitted to any college, institution or university for any academic award other than the University of Nairobi.

Signed

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Date……07/12/2020……

LILIAN NJOKI MUTHEE

REG NO: D63/81526/2015

This research project has been presented for presentation with my approval as supervisor

Signed…  **…….Date: …07/12/2020……..**

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DEDICATION

I dedicate this project to God Almighty for His unmerited favor throughout this process. He has been a source of wisdom, knowledge, understanding and strength. I also dedicate this project to my mother, Rahab Mathenge, for her patience, encouragement and prayers during the entire time.

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I am sincerely grateful to my supervisor Dr. Angela Kithinji who guided me through drafting and refining this project; her practical advice, patience, immense experience has enabled me to complete this work on time. She was readily available to guide me through my research project and without her support this project would not have been possible.

I would also like to thank and acknowledge the University of Nairobi (School of Business) for allowing me to conduct my research and providing any assistance requested.

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ABBREVIATIONS AND ACRONYMS

ADF	**:**	Augmented Dickey Fuller
ANOVA	**:**	Analysis of variances
BFS	**:**	Bank financial soundness
CBK	**:**	Central Bank of Kenya
DEA	**:**	Data Envelopment Analysis
FEM	**:**	Fixed Effect Model
GCC	**:**	Gulf Cooperation Council
GDP	**:**	Gross Domestic Product
MFBs	**:**	Micro Finance Banks
MFIs	**:**	Micro Finance Institutions
NPLs	**:**	Nonperforming Loans
OLS	**:**	Ordinary Least squares
PCSEs	**:**	Panels corrected standard errors
REM	**:**	Random effect Model
ROA	**:**	Return on Assets
ROE	**:**	Return on Equity
VIF	**:**	Variance Inflation Factor

ABSTRACT

The study sought to establish the effect of bank financial soundness on the operational efficiency of microfinance banks in Kenya. The study was based on buffer capital theory, information asymmetry theory and shiftability theory of liquidity. The study was based on descriptive survey research. The target population was all the 13 microfinance banks (MFBs) licensed by the CBK as at 31st December 2019 (CBK, 2020). The study targeted a period of six (6) years beginning 2014 to 2019 forming a panel data. Relevant secondary data was extracted from the published annual banking sector reporting by the central bank. The data collected was recorded on data collection sheets. Diagnostic tests namely test for normality, autocorrelation and multicolliniarity, serial correlation and heteroscedasticity were conducted. The data collected was analyzed using STATA version 15. Data analysis involved descriptive and inferential statistics. Minimum, maximum, skewness, kurtosis, standard deviation and mean formed the descriptive analysis. The inferential statistics included pairwise correlation and multivariate regression analysis. Given that the panel data was exposed to problem heteroscedasticity, serial correlation and correctional dependence, the study adopted Panel correlated standard errors (PCSEs) regression model. The findings showed that the coefficient of determination (R) was .651 implying that the model explains 65.1% of the variation in operational efficiency. The Analysis of Variances (ANOVA) showed that bank financial soundness had a significant effect on operational efficiency MFBs in Kenya ($F= 369.526$, $p= .000 <.05$). Additionally, the regression coefficients showed the effect of individual bank financial soundness indicators on operational efficiency of MFBs in Kenya. The effect of asset quality on operational efficiency was negative and statistically significant. The effect of capital adequacy on operational efficiency was inverse and statistically significant. The study also showed that profitability had a statistically significant positive effect on operational efficiency. The effect of bank liquidity on operational efficiency was statistically significant and negative. The study thus concludes that financial soundness had significant effect on operational efficiency of MFBs in Kenya. The study findings have implications for practice and policy purposes. The study recommends to management of MFBs in Kenya to continue offering high value and quality assets to be able to increase the operational efficiency of the banking intuitions. The study suggest to management of MFBs in Kenya actively seeks deposit financing. As long as the minimum capital requirement is not breached. The study also recommends to the CBK to closely monitor the despots funding structure of MFBs to ensure they adopt optimal leverage that ensures that their average costs are at minimal. The study also suggests to management of MFBs in Kenya to continue innovating new products that translates to income growth. Additionally, the MFBs should implement lean operations through adoption of cost saving and efficiency enhancing technologies. The study also suggest to CBK to proactively approve new products by the MFBs and encourage them to adopt banking technologies that enhances cost efficiency of the said MFBs.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Globally, organizational efficiency has been a major concern both in the developed and developing economies of the world after witnessing poor bank performance. According to Kariuki (2016), the immediate reason that can be adduced to bank failure can be inefficient or poor allocation of corporate resources. Because of this process, there has been a clarion, call and greater emphasis on the importance of improved efficiency in the banking sector worldwide. Bank financial soundness among other factors are critical in determining operational Microfinance banks. Bank financial soundness (BFS) are aggregate measures of the current financial health of a financial institution in a country. The indicators of bank financial soundness may include asset quality, capital, earnings, profitability and bank liquidity (Ifeacho et al., 2014).

The research was underpinned by three theories including Buffer capital theory, information asymmetry theory and shiftability theory of liquidity. The buffer capital theory proposed by Calem and Rob (1996) holds that banks nearing regulatory minimum capital ratio tends to bring in more capital to avoid solvency risk and regulatory fines (Dao & Nguyen, 2020). Akerlof (1970) and Stiglitz (1976) developed the Informational Asymmetry theory. The theory of information asymmetry holds that information asymmetry is accompanied by problems of moral hazard and adverse selection that leads to deterioration in asset quality through accumulation of nonperforming loans. Moulton (1918) advanced shiftability theory that postulates that bank should hold adequate short term marketable securities that can easily be converted into cash to settle maturing obligations (Maaka, 2013).

1.1.1 Bank Financial Soundness

Bank Financial Soundness (BFS) are aggregate measures of the current financial health of a financial institution in a country. The indicators are asset quality, capital adequacy, earnings, profitability and bank liquidity (Ifeacho et al., 2014). Seyedi and Abdoli (2019) showed that factors affecting banks financial soundness of banking institutions includes asset quality, liquidity, profitability and capital adequacy among other bank soundness variables. Asset quality measures the probability of default in total loans of a bank as measured by non-performing loans to total loans ratio. Lower ratio depict high quality bank loans (Ongore et al., 2013). Capital

adequacy is the amount of equity that is held by the bank to act as buffer for the bank loans and other assets (Mendoza & Rivera, 2017). Ratio of equity to total assets has often been adopted in most empirical studies as the proxy for capital adequacy.

Profitability is a measure of performance of a business generally being the difference between total revenues and total expenses. Profits is said to be earned when total revenues exceeds total expenses and loss is made when total expenses exceeds total revenues (Haris, Yao, Tariq, Malik & Javaid, 2019).Various proxies including return on assets (ROA) and return on equity (ROE) measure profitability of a bank just like in other businesses. Higher ROA and ROE depicts better financial soundness of the financial institution (Mendoza & Rivera, 2017). Bank liquidity is the capability of institutions to make cash or other liquid assets available on demand or as assets readily convertible to cash without loss to enhance banks' ability to satisfy depositors on demand. Liquidity is the level of liquid asset that a bank possesses at a time (Jiang, Levine & Lin, 2019). The ratio of liquid assets to total deposits is often adopted as a proxy for liquidity of a banking institution.

1.1.2 Operational Efficiency

Operational efficiency in banking institutions is the ability of a banking to provide a given level of financial intermediation services at the least possible cost or the ability of a banking institution to provide the highest possible level of financial intermediation services within a given budget constrain (Kariuki, 2016). Operational efficiency is also defined as the ability of a banking institution to pool funds from depositors with excess liquidity in form of savings and advance the funds generated to borrowers with deficit liquidity as minimal costs possible. (Oke & Abere, 2019). Finally, Olarewaju and Obalade (2015) defined operational efficiency as tactical planning by banking firms to reducing costs and maximizing the benefits of resources by providing better services to bank customers.

Operational efficiency of banking institutions remain acritical aspect of the overall firm performance given that resources are scarce, so it makes economic sense to try to conserve them while maintaining an acceptable level of output level (Ifeacho et al., 2014). Operational efficiency is concerned with eliminating resources wastages and enhancing output with a given budget outlay (Luo, Tanna & De Vita, 2016). Operational efficiency aims at minimizing

redundancy and waste so that the resource savings leads to reduced operational costs that further results to improved profitability and financial services delivery (Olarewaju, 2015). The operational efficiency is usually measured the ratio of operating income to operational costs of the financial intuition.

1.1.3 Bank Financial Soundness and Operational Efficiency

Empirical and theoretical literature has examined the association between bank financial soundness and operational efficiency. Empirical evidence indicates that the bank financial soundness variables (asset quality, adequacy of capital, earnings quality, liquidity) that are under bank managers control have significant influence on the efficiency and performance of such entity (Adeleye, Osabuohien, Bowale, Matthew & Oduntan, 2018). Ifeacho, et al. (2014), revealed that the core-sets of indicators responsible for bank's soundness are bank liquidity, asset quality, capital adequacy, profitability and sensitivity to market risk usually employed in monitoring the financial health of a country's financial industry, its corporate body or household sector.

Kariuki et al. (2016) on the causal effect link between financial intermediation efficiency and asset quality noted that asset quality has a direct influence on intermediation efficiency. The direct relationships depicts that enhanced assets quality leads to improved intermediation efficiency of the firm. Olarewaju and Akande (2015) on the association between operational performance and capital adequacy showed that capital adequacy had a direct causal effect link with operational efficiency. Akhter and Roy (2017) on the evaluation of the factors affecting the efficiency noted that liquidity, credit risk, efficiency, and profitability are the factors affecting banks' soundness. The current study expects a direct causal effect link between bank financial soundness and operational efficiency such that enhanced financial soundness of the concerned deposit taking micro finance banks should leads to improved operational efficiency.

1.1.4 Deposit Taking Microfinance Banks in Kenya

Micro-finance refers to availing a wide range of financial services including loans, savings accounts, money transfer services, insurance among other service to low income groups and small and micro businesses (Lawal, 2018). Microfinance institutions (MFIs) may be categorized into four categories of firms Microfinance banks, deposit-taking Saccos, non-government

organizations and moneylenders. The Microfinance Act authorizes the Central Bank of Kenya (CBK) to licence and regulate operations of deposits taking microfinance banks (MFBs). The Central Bank as regulator issues specific regulations and advisory relating to day-to-day operations of the MFBs. In particular, the central banks issues prudential regulations including core capital requirement, liquidity requirement, assets quality categorizations among other regulations (AMFI, 2018).

The MFI prudential regulations states that MFIs under the act must maintain a core capital of 20 million for community MFIs and 60 million for nationwide MFIs. Additionally, they must maintain a liquidity ratio of twenty percent of all liabilities including deposit (Central Bank of Kenya, 2019). In addition, deposit-taking MFIs must make certain disclosures regularly and when called upon by the regulator. The act also requires that Loans and advances be classified depending on the possibility of default. The loan loss provisions for loan losses must also be attached to assets classification (CBK, 2019). The study scope will be in the deposit taking micro finance banks licensed by the central bank of Kenya (CBK). There were 13 microfinance banks (MFBs) licensed by CBK as at 31st December 2019.

1.2 Research Problem

The causal effect relationship between bank financial soundness and operational efficiency of micro finance banks is critical. The operational efficiency determines the long-term survival of the microfinance bank (Magweva & Marime, 2016). Given the dynamic and competitive nature of banking sector in Kenya, the microfinance banking institutions have facing very stiff competition from the established commercial banks in Kenya. The microfinance banks have been operating under strict regulation by the central bank, stiff competition from established commercial banks, Deposit taking Sacco's, lending only microfinance institutions and loan applications in Kenya. The study envisages a direct causal effect relationship between financial soundness and operational efficiency of micro finance banks in Kenya. Bank soundness in terms of quality loan assets, adequate core capital, positive profitability and adequate liquidity should translate to enhanced operational efficiency of microfinance banks (Mendoza & Rivera, 2017).

The association between bank financial soundness and operational efficiency in the context of deposit taking micro finance banks in Kenya has been examined. Financial reporting by Central

bank of Kenya in the recent time shows that the overall profitability of the microfinance banks (MFBs) declined significantly with the sector reporting a lower ROA at negative 2.0 % in 2018 compared with negative 0.9 percent in 2017. The deposits from customer rose by 5.3 % from Ksh.38.9 billion in 2017 to Ksh.41.0 billion in 2018. Additionally, loans and advances increased by 3.1 % from Ksh.42.8 billion in 2017 to Ksh.44.2 billion in 2018. The assets size increased from Ksh.67.60 billion in 2017 to Ksh.70.75 billion in 2018 (CBK, 2018).

Globally, Lawal (2018) investigated the casual effect link between operational efficiency and bank soundness in Nigeria. Quantitative research was employed with data collected from 15 deposit money banks. Balanced panel data model was employed with findings indicated that bank financial soundness has a major influence on operational efficiency. Banna, Ahmad and Koh (2017) evaluated the impact of financial crisis, firm size, capital adequacy, ROE and real interest rate on efficiency of banks in Bangladesh. The study adopted DEA and panel data regression to analyze data collected between 2000 and 2013. Results revealed that financial crisis, capital adequacy, firm size, ROE and real interest rate majorly affected efficiency of the institutions studied. Bitar, Pukthuanthong and Walker (2018) evaluated the impact of capital adequacy on efficiency and risks of banks. The study showed that capital adequacy and risk weighted capital ratios enhanced banking efficiency. Additionally, risk weighted capital adequacy ratios failed to reduce bank risk.

Locally, Kariuki (2016) examined the causal between firm specific characteristics and efficiency among DT Saccos in Kenya. The study target one hundred and three firms in five-year period from 2011 to 2014. DEA and panel data regression models were adopted. The research established that liquidity and capital adequacy did not affect financial intermediation efficiency. However, asset quality had a direct impact on intermediation efficiency. Kubai (2016) examined the effect of NPLs on operational efficiency of commercial banks in Kenya. The study used exploratory design with secondary data collected the forty-three commercial banking institutions. Panel data regression model was adopted with the findings revealing that the association between operational efficiency and NPLs was inverse. Nasieku (2014) examined the effect of capital adequacy on efficiency of banks in Kenya. The study adopted panel data regression model with findings showing that capital adequacy had no significant effect on bank efficiency. However, the effect of weighted capital adequacy ratio significantly affected bank efficiency. There exist

knowledge gap in the micro finance banks in Kenya with most studies on the association between bank financial soundness and operational efficiency being based in commercial banks. The study sought to fill the knowledge gap by examining the question; what is the effect of bank financial soundness on the operational efficiency of microfinance banks in Kenya?

1.3 Objectives of the Study

The study sought to establish the effect of bank financial soundness on the operational efficiency of microfinance banks in Kenya.

1.4 Value of the Study

The completed study generates a valuable report that may be useful for theory, practice and policy. Regarding theory, the current study contributes on the underpinning of various theories to the relationship between bank operational efficiency and bank financial soundness. The study presents the relevance of information symmetry theory, buffer capital theory and assets transferability theory on the association between bank operational efficiency and financial soundness. The study areas for further study will be help future researcher in identifying gaps for their studies. The study will also form present a strong empirical literature for further studies in the area of bank financial soundness and operational efficiency.

Regarding practice, Microfinance banks and bankers are likely to benefit greatly from this research in terms of information generate regarding the association between bank financial soundness and operational efficiency. The study offers useful insights to management of MFBs on how to avoid mismatch and reduce risks of liquidity. The study also offers insights to managers of MFBs on the factors contributing to bank financial soundness and the resulting association between bank soundness and operational efficiency. The managers of the MFBs can closely watch and manage the bank soundness factors within their discretion to enhance financial intermediation efficiency of their respective financial institutions.

Finaly, with respect to policy, the study is an important document for the central bank of Kenya, which is the regulator for MFBs in Kenya. The study report is insightful to the regulator regarding the factors affecting bank financial soundness and how they interact with operational efficiency in the context of MFBs.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The chapter elaborates on the theoretical foundations, factors affecting operational efficiency, empirical review, summary of literature and research gaps and conceptual framework. The purpose of the literature review will be to identify knowledge gaps for leading to the study.

2.2 Theoretical Foundations

The research was underpinned by three theories including buffer capital theory, information asymmetry theory and suitability theory. The theories provides theoretical underpinning on the association between bank financial soundness and operational efficiency of MFB in Kenya.

2.2.1 Buffer Capital Theory

The buffer capital theory proposed by Calem and Rob (1996) holds that banks nearing regulatory minimum capital ratio find itself enhancing its capital base to avoid liquidation risk and fines form the regulator when minimum capital requirement is breached (Dao & Nguyen, 2020). Capital buffer is the excess capital on top of the core capital requirement by the regulator of the banking institution. The theory holds that the behavior of a bank regarding capital will depend on size of the capital. Banks that have sufficient capital above the core capital requirement only seeks to maintain the capital level while those that do have capital level near minimum core capital requirements have to boost their capital by bringing in more capital (Heid, Porath, & Stolz, 2004).

Empirical studies have tended to establish that financial institutions with higher capital buffers above the core capital requirement are better prepared to offer lending services especially during financial crises. Such firms' able better in absorbing risk of default and offer morel loans during financial crisis (Jokipii & Milne, 2011). Moh'd Al-Tamimi, and Obeidat (2013) noted that capital buffers act as a safety valve for depositors money and covers any possible loan losses that may be experienced by the banks during period of financial crisis that is affecting the entre banking system. The capital buffer is a managerial discretionary area of decision making where different banks hold different amount of buffer capital in absolute values and relative to assets of the banks.

The buffer capital theory is critical on the association between capital adequacy and operational efficiency of MFBs. The theory is relevant in the introduction of capital adequacy, as a proxy for financial soundness given those banks with adequate buffer capital also tends to be more efficient in their financial intermediation role. The theory facilitates analysis of the effect of capital adequacy as a firm characteristic on intermediation efficiency in that if all MFBs were to hold the minimum capital prescribed by the regulator, capital adequacy would cease to be specific firm financial soundness factor. The theory therefore justifies the choice of capital adequacy as bank financial soundness factor.

2.2.2 Theory of Informational Asymmetry

Akerlof (1970), Spence (1973) and Stiglitz (1976) developed the Informational Asymmetry theory. The theory of information asymmetry holds that the information possessed by the lender and the borrower regarding risks and returns from investment opportunities differs. The party with inadequate information about the risks involved in a transaction may not make accurate decisions when conducting the transaction (Nyamweya and Obuya, 2020). Consequently, borrowers usually have more information concerning proposed venture in which they are seeking loans compared to the lending institutions hence information asymmetry. (Obuya and Olweny, 2017). In the presence of asymmetric information, the market may break down completely with consequences including moral hazard, adverse selection and monitoring cost.

According to Obuya and Olweny (2017), moral hazards arise when the borrower takes advantage of information asymmetry and gives misleading information about the proposed business venture thereby leading to loan losses when the borrower default on loans advanced. Mavlanova, Benbunan-Fich and Koufaris, (2012) explains that adverse selection happens when the lender ,due to information asymmetry, charges a high rate on interest to all borrowers irrespective of their risk level such that paying borrowers covers borrowers who will default on loans. The high interest rate may lead to even more loan defaults when the businesses for which the loans were taken fail to pick up due to high cost of capital eating into the profits of the businesses. Moral hazard and adverse eventually results to reduced efficiency in financial intermediation as credit rationing may occur where deserving loan applicants are denied loans (Matthews & Thompson, 2008).

The information asymmetry theory is relevant for study on the association between asset quality and operational efficiency. The theory explains that information asymmetry is accompanied by problems of moral hazard and adverse selection that further leads to deterioration in asset quality through accumulation of nonperforming loans. The accumulation of NPLs further leads to banks rationing credit and charging high interest rates locking out deserving borrowers hence intermediation inefficiency. The theory also acknowledges that credit appraisal cannot be effective and therefore non-performing loans (NPLs) will always arise. However, measures may be put in place to reduce information asymmetry, one such measure is credit information sharing.

2.2.3 The Shiftability Theory of Liquidity

Moulton (1918) advanced shiftability theory that postulates that bank should hold adequate short term marketable securities that can easily be converted into cash to settle maturing obligations withdrawals from demand deposits and time deposits accounts (Maaka, 2013). The liquidity of the bank is best captured by its ability to shift its marketable assets like securities into cash to when need arises with minimal loss to transaction fees (Casu & Girardone, 2006). Moulton (1918) further explained that the amount of marketable securities held by a bank depends on the needs such that during high needs for cash, marketable securities are exchanged for cash and during low cash needs, cash is exchanged for marketable securities.

The theory informs the choice of measures of liquidity in financial institutions where liquid assets to deposits ratio is used in measuring liquidity of banks. Lower liquid assets to deposit ratio implies inadequate liquidity by the bank hence it may not accept more obligations while high liquid assets to deposits ration implies that the bank has adequate liquidity hence may undertake more lending activities (Moore, 2010). The theory explains that banks will hold more marketable securities during periods of low cash demands by converting excess cash vaults into marketable securities while during periods of high cash needs, the marketable securities are converted into cash to settle maturing obligations as they fall due (Casu & Girardone, 2006).

The theory is relevant for the study on the association between bank liquidity and operational efficiency and justifies holding the minimum liquidity as stated in the prudential guidelines by the CBK to MFBs. The MFBs rate their liquidity position with the proportion of assets held inform of marketable securities. The liquidity position of the MFBs affects their ability to issue

new loans hence their financial intermediation efficiency. This justifies why liquidity may be firm financial soundness variable where firms hold different level of liquidity over and above the minimum prescribed by the regulator. It also points to an important linkage between liquidity and efficiency of financial institutions.

2.3 Determinants of Operational Efficiency of Financial Institutions

A number of factors affects the operational efficiency of financial institutions including the deposit taking MFBs. The current study focused on four factors affecting operational efficiency that constitutes the bank financial soundness. The factors includes asset quality, capital adequacy, profitability and liquidity.

2.3.1 Assets Quality

Asset quality is the ability of assets of the bank to generate required returns in a timely manner according to contractual obligations. Asset quality of banking institutions is often measured by the ratio of NPLS to gross loans (Alhassan, Kyereboah-coleman, & Andoh, 2014). Empirical literature tends to establish inverse causal effect link between NPLs and operational efficiency given that high NPLs means banks would apply credit rationing at high interest rate hence making financial intermediation to be inefficient (Gulati, Goswami & Kumar, 2019). Piskorski, Seru and Witkin (2015) noted that banks that had high level of NPLs also tended to be less efficient compared to their counter parts that had lower NPLs to gross loans ratio. Odunga, Nyangweso, Carter and Mwarumba (2013) showed that credit risk that measures assets quality had a major inverse effect on operating efficiency of banking financial institutions.

2.3.2 Capital Adequacy

Capital adequacy is the amount of equity that safeguards depositors' funds and protect the bank against liquidation risk. The capital adequacy is often measured using the ration of equity of the bank to total assets or deposits (Akhter, 2018). Literature has not conclusively shown that strengthened capital will improve banking system stability and enhance intermediation efficiency. Maghyereh and Awartani (2014) argue that while banks having high equity to total assets ration are better covered in terms of protecting depositors money invested into loans hence improves intermediation efficiency as the bank can take on more lending obligations. On the other hand, banks having lower equity to total assets ratio has less buffer to protect against risk

of liquidation and continue offering loans especially during financial crisis affecting the whole economy. However, Nasieku (2014) noted that buffer capital that is at the discretion of the bank managers has not effect on efficiency of banks.

2.3.3 Profitability

Generally, the causal effect link between profitability and efficiency is expected to be direct since highly profitable MFBs also tends to be more cost inefficient. In that line of relationship, majority of scholars have tended to establish direct relationship between profitability proxies and operational efficiency of banking institutions (Maghyereh and Awartani, 2014). However, other scholars such as Gulati, Goswami and Kumar (2019) found a negative relationship. Goswami and Kumar (2019) established an inverse relationship between profitability and cost efficiency. Goswami and Kumar (2019) revealed further that the inverse relationship is because most cost efficient banks were those that has invested large resources in use of technology to drive down costs hence that negatively affected their profitability in the short run period. Alrafadi, Kamaruddin and Yusuf (2014) revealed that there was direct causal effect relationship between bank efficiency and ROA. The relationship was positive in that more profitable banks are able to attract deposit funding which is relatively cheaper compared to wholesale funding hence they are cost efficient.

2.3.4 Liquidity

Liquidity is the capability of banking institutions to settle maturing obligations when they fall due. The obligations includes, loan request, deposits withdrawals and other liabilities (Akhter, 2018). The inability of banking institutions to settle its maturing obligations may result to bank ran hence and loss of credit worthiness by the bank and associated legal liability on negation of contractual agreements (Adam, Safitri & Wahyudi, 2018). Gao (2016) noted that there was direct causal effect link between efficiency and liquidity. Osazefua (2019) on the other hand establish inverse link between efficiency and liquidity of commercial banking firms in Malesia. The study explained that banks were holding high liquidity at the expense of opportunities that the money could earn the bank if it were invested in income bearing assets.

2.4 Empirical Literature

Lawal (2018) investigated the casual effect link between operational efficiency and bank soundness in Nigeria. Quantitative research was employed with data collected from 15 deposit money banks. Descriptive and inferential statistics were employed with the use of panel least regression model and appropriate model diagnostic tests carried out on the panel data. Findings indicated that bank financial soundness has a major influence on operational efficiency. In addition, findings from the empirical evidence provided by the study indicate that banks must be operationally efficient to ensure improved financial soundness and health for the entire banking system. Conclusively, the results from the study therefore upheld a priori theoretical expectation that bank financial soundness has significant effect statistically on operational efficiency. Consequently, bank financial soundness could reduce asset liabilities mismatch and potential agency cost from bank managers, improve credit risk exposure while enhancing operational efficiency and stakeholders' interest.

Kariuki (2016) examined the causal between firm specific characteristics and efficiency among DT Saccos in Kenya. The study independent variables included assets quality, liquidity, capital adequacy and profitability. The study target one hundred and three firms in five-year period from 2011 to 2014. DEA and panel data regression models were adopted. The research established that liquidity and capital adequacy did not affect financial intermediation efficiency. However, asset quality had a direct impact on intermediation efficiency. Banna, Ahmad and Koh (2017) evaluated the impact of financial crisis, firm size, capital adequacy, ROE and real interest rate on efficiency of banks in Bangladesh. The study adopted DEA and panel data regression to analyze data collected between 2000 and 2013. Results revealed that financial crisis, capital adequacy, firm size, ROE and real interest rate majorly affected efficiency of the institutions studied.

Olarewaju (2016) evaluated the causal effect link obtaining between operational efficiency and capital adequacy of banking institutions in Nigeria. The study adopted secondary data from 2004 to 2013 with data analyzed based on FEM. The study noted that leverage and capital adequacy had a major effect on operational efficiency. Mohammed (2018) examined the association between capital adequacy and efficiency among Islamic and conventional banks in the case of the Gulf Cooperation Council (GCC) region. The research examined twenty-five Islamic banks and twenty-five conventional banks collecting secondary data between 2006 and 2015. The

research used DEA and panel regression analysis to examine the causal effect link between the study variables. The research revealed that Islamic banks were less efficient compared to their conventional counterparts. In addition, capital adequacy inversely influenced efficiency of banks studied.

Bitar, Pukthuanthong and Walker (2018) evaluated the impact of capital adequacy on efficiency and risks of banks. The study showed that capital adequacy and risk weighted capital ratios enhanced banking efficiency. Additionally, risk weighted capital adequacy ratios failed to reduce bank risk. Ifeacho and Ngalawa (2014) evaluated the causal effect link among banks specific factors and macroeconomic aggregates on bank performance in banking intuitions in South Africa. The study collected secondary data from 1994 to 2011. The study adopted fixed effect panel data model with results showing that asset quality, liquidity and earnings had direct effect on financial performance measured by ROA.

Batir, Volkman and Gungor (2017) carried out comparative study to compare efficiency of Islamic and conventional banks Turkey. The data was collected between 2005 and 2013. The research used the DEA and Tobit regression analysis to compare efficiencies of conventional and Islamic banks. The research showed that technical efficiency was higher that allocative efficiency both bank classes. The study further showed that loans had a direct effect efficiency while the causal effect association between deposits, expenses, GDP, size, capital, NPLs, inflation and efficiency was inverse. Shaddady and Moore (2019) examined the causal effect relationship between operational efficiency and financial regulations. The study used Data DEA and unbalanced panel data model to analyze secondary data collected from seven thousand eight hundred and fifty three spread across 102 countries over fifteen year period from 2000 to 2014. The study showed that capital adequacy and bank regulations were directly associated with banking institutions efficiency.

Sakouvogui and Shaik (2020) examined the significance of solvency and liquidity on cost efficiency of banks in US. The study used descriptive design with data collected from eleven thousand and forty four firms in US between 2005 to 2017. The study adopted Tobit regression model to examine the association between liquidity, solvency and cost efficiency. The study revealed that the causal effect link between solvency, liquidity and cost efficiency. Kubai (2016) examined the effect of NPLs on operational efficiency of commercial banks in Kenya. The study

used exploratory design with secondary data collected the forty-three commercial banking institutions. Panel data regression model was adopted with the findings revealing that the association between operational efficiency and NPLs was inverse.

Seyedi and Abdoli (2019) aimed to identify financial soundness indicators in Iranian banks based on the viewpoints of 382 banking experts. Data gathering was done by designing and administering questionnaire. The research method is descriptive-correlation. For data analysis and the testing of the hypotheses, R test software and confirmatory factor analysis have been used. TOPSIS method is used to rate the indicators from the points of view of senior banking managers. The findings showed capital adequacy, asset quality, profitability, liquidity, management quality, sensitivity to market risk, Islamic banking, corporate governance, and facilities with technical and economic backing affect the financial soundness of banks, while the liquidity and profitability indexes have the most impact.

2.5 Summary and Knowledge Gap

Lawal (2018) indicated that bank financial soundness has a major influence on operational efficiency. Kariuki (2016) research established that liquidity and capital adequacy did not affect financial intermediation efficiency. However, asset quality had a direct impact on intermediation efficiency. Banna, Ahmad and Koh (2017) revealed that financial crisis, capital adequacy, firm size, ROE and real interest rate majorly affected efficiency of the institutions studied. Olarewaju (2016) noted that leverage, capital adequacy, had a major effect on operational efficiency. Mohammed (2018) revealed that Islamic banks were less efficient compared to their conventional counterparts. In addition, capital adequacy inversely influenced efficiency of banks studied. Bitar, Pukthuanthong and Walker (2018) showed that capital adequacy and risk weighted capital ratios enhanced banking efficiency. Ifeacho and Ngalawa (2014) showed that asset quality, liquidity and earnings had direct effect on financial performance measured by ROA. However, the impact of capital adequacy on financial performance was inverse. Batir, Volkman and Gungor (2017) revealed that technical efficiency was higher that allocative efficiency both bank classes. The study further showed that loans had a direct effect efficiency while the causal effect association between deposits, expenses, GDP, size, capital, NPLs, inflation and efficiency was inverse. Shaddady and Moore (2019) showed that capital adequacy and bank regulations were directly associated with banking institutions efficiency.

2.6 Conceptual Framework

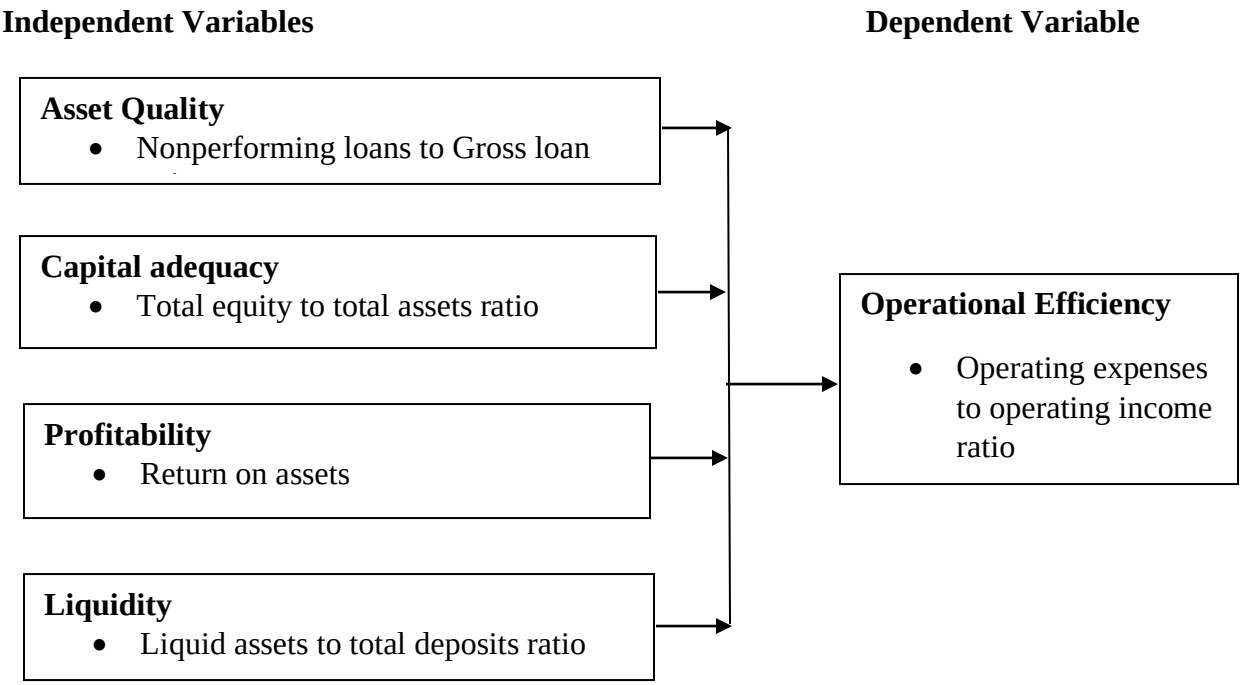

Figure 2. 1: Conceptual Model

Figure 2.1 presents the conceptual model for the relationship between study variables. The independent variable is financial soundness captured by liquidity, profitability, asset quality, and capital adequacy. The dependent variable is operational efficiency. The study expected positive association between capital adequacy, profitability, liquidity and operational efficiency. However, the relationship between asset quality and operational efficiency is expected to be inverse.

CHAPTER THREE: METHODOLOGY

3.1 Introduction

The chapter elaborates on methods and techniques that were adopted to collect and analysis data. The chapter specifically covered the research design, target population, data collection procedure and data analysis.

3.2 Research design

The research employed descriptive survey research to ascertain the causal effect link between bank financial soundness and operational efficiency of deposit taking MFBs in Kenya. According to Saunders et al. (2009), descriptive survey design is the quantitative data collected to be analyzed through descriptive and inferential statistics. The research design was adopted due to both its quantitative and non-experimental nature that involves data collection of different individual banks at specified period. The research design is formal, objective and uses a systematic process to gather its numerical data (Saunders et al., 2009).

3.3 Target Population

The target population was all the 13 microfinance banks (MFBs) licensed by the CBK as at 31st December 2019 (CBK, 2020). The list of MFBs is presented in appendix ii. The study targeted a period of six (6) years beginning 2014 to 2019 forming a panel data. This period suits the purpose of the research as it incorporate recent financial reforms in microfinance sub sector.

3.4 Data Collection Procedure

Relevant secondary data was extracted from the published end year statements of the individual firms and the annual banking report by the Central Bank of Kenya. The study collected annual data for six years beginning 2014 to 2019. The data collected was recorded on data collection sheets. Data collected were asset quality proxy (non-performing loans to gross loans), capital adequacy proxy (total equity to total asset), and profitability proxy (return on assets to total asset). Bank liquidity proxy (liquid asset to total deposit). Operating income and operating expenses were collected as proxies for Operating efficiency.

3.5 Diagnostic Tests

Diagnostic tests namely test for normality, autocorrelation and multicollinearirty, serial correlation and heteroscedasticity were conducted. The purpose of the tests is to ensure that the regression model adopted is robust (Bollen, Biemer, Karr, Tueller & Berzofsky, 2016).

3.6 Data Analysis

The data collected in data collection sheets were checked for completeness and entered into Microsoft excel. The various proxies for the variables were generated in the excel before the data is exported to STATA version 15. The data collected were analyzed with the assistance of STATA software. Data analysis involved descriptive and inferential statistics. Minimum, maximum, skewness, kurtosis, standard deviation and mean will form the descriptive analysis. The inferential statistics included pairwise correlation and multivariate regression analysis. Given that the data was panel in nature, the study adopted panel data regression model to examine the association between bank financial soundness and operational efficiency of Deposit taking MFBs licensed by CBK.

3.6.1 Regression Model

The analysis was based on the model shown in equation (1).

$$OE_{tj} = \beta_0 + \beta_1 AQ_{tj} + \beta_2 CA_{tj} + \beta_3 PR_{tj} + \beta_4 LQ_{tj} + \varepsilon \quad \text{.....(1)}$$

Where OE is the dependent variable operational efficiency measured by the ratio of operating expenses to operating income.

AQ = Asset Quality measured by ratio of nonperforming loans to total loans advised

CA= Capital Adequacy measured by the ratio of equity to total assets

PR= Profitability measured by ratio of after tax profits to total assets

LQ= liquidity measured by ratio of liquid assets to total deposits

β_1, β_2, β_3 and β_4 are the parameter estimates for the independent variables.

β_0 = Intercept term

ε = error term capturing effect of unobserved variables

t = time period 2014,2015, 2016, 2017, 2018 and 2019

j= is the cross sectional units that is the 13 micro finance banks in Kenya.

3.6.2 Test of Significance

The significance of the effect of explanatory variables was conducted at 95% confidence level. The overall significance of the effect of bank financial soundness on operational efficiency was determined by F test where F-calculated greater than F-critical meant that bank financial soundness has significant effect on operational efficiency of MFBs. The study showed that bank financial soundness had a significant effect on operational efficiency MFBs in Kenya.

The significance of the effect of individual explanatory variables on operational efficiency was determined by student t test where t-calculated greater than t-table meant the individual explanatory variable has a significant effect on operational efficiency of the MFBs. The study showed that the effect of asset quality on operational efficiency was negative and statistically significant, the effect of capital adequacy on operational efficiency was positive and statistically significant, profitability had a statistically significant negative effect on operational efficiency and the effect of bank liquidity on operational efficiency was statistically significant and positive.

CHAPTER FOUR

FINDINGS AND DISCUSSION

4.1 Introduction

The study sought to examine the effect of bank financial soundness on operational efficiency of deposit taking microfinance banks in Kenya. The data analysis was based on descriptive and inferential statistical analysis. The descriptive analysis involved mean, standard deviation, minimum and maximum and line graphs. The inferential analysis involved Pearson correlation and panels corrected standard errors (PCSEs) regression.

4.2 Descriptive Analysis

The descriptive analysis involved mean, standard deviation, minimum and maximum and line graphs. The purpose of descriptive analysis was to examine and describe the general nature of the data in terms of distribution. The study used summary of descriptive to analysis data as presented in table 4.1.

Table 4. 1: Summary of Descriptive Analysis

Variable	Obs	Mean	Std.Dev.	Min	Max
AQ	73	.244	.199	0	.725
CA	73	.291	.224	-.306	.836
PR	73	-.087	.137	-.542	.038
LQ	73	.494	.428	.021	2.31
OE	73	1.932	2.047	.594	14.333

Independent variable: AQ= Asset quality, CA= capital adequacy, PR= profitability, LQ= liquidity
Dependent variable: OE= operational efficiency

Asset quality was measured by the ratio of Nonperforming loan to total loans. The mean assets quality was .244 implying that on average for all the MFBs studied, the Nonperforming loans (NPLs) were about 24.4% of the total loans advised to customers. The standard deviation was .199 measuring the distribution of individual observation about asset quality around the mean. The MFB with the least assets quality has assets quality of zero (0) implying the bank had non non-performing loans. The maximum assets quality was .725 implying that 72.5 % of the total loans was none performing.

Capital adequacy was measured by the ratio of equity to total assets. The mean capital adequacy was .291 meaning for the MFBs in Kenya; the shareholders' funds were about 29.1% of the total assets of the MFBs. The standard deviation was .224 showing that the individual observations were spread away from the mean by about 22.4%. The minimum capital adequacy was -.306 implying that that the specific firm was insolvent as the shareholders' funds was negative. The maximum capital adequacy was .836 implying that the shareholders' funds was about 83.6% of the total assets of the specific MFB.

Profitability was measured by the ratio of NPAT to total assets. The mean profitability was -.087 implying that the average ROA for all firms in the study period was about -8.7% of the total assets. Most of the MFBs recorded negative profits during the study period depicting stiff competition from established commercial banks. The standard deviation for profitability was .137 implying that individual observations were spread around the mean with ROA of 13.7%. The minimum profitability was -.542 meaning that the ROA was -54.2%. The maximum profitability was .038 that is ROA of about 3.8%.

Liquidity was measured by the ratio liquid assets to total deposits of the MFBs in Kenya. The mean liquidity was .494 implying that the firm held about 49.4% of the value of funds deposited by customers in short term liquid assets. The standard deviation for liquidity was .428 implying the individual observations were spread around the mean by about .428 units. The minimum liquidity was .021 implying the firm that held the lowest amount of liquid assets held about 2.1% of total deposits. The maximum liquidity was 2.31 implying that the specific firm held more than customer deposits especially for new MFBs that were still relying on own cash and were still low on customer deposits.

The operational efficiency was measured by the ratio of operational expenses to operating income. The mean operational efficiency was 1.932 implying that on average, the operational expenses for most MFBs outweighs the operational income. The standard deviation was about 2.047 implying that the individual observations about operational efficiency were spread around the mean by 2.047 units. The minimum operational efficiency was .594 implying the most efficient MFB during the study period had operating expenses of about 59.4% of the operating income. The maximum operating efficiency was 14.333 implying that the operating expenses outweigh operating income 14 times.

4.3 Diagnostic Tests.

Diagnostic tests namely test for normality, autocorrelation and multicolliniarirty, serial correlation and heteroscedasticity were conducted.

4.3.1 Normality Test

In this study, Schapiro wilk test was used to test for normality. Probability values greater than 0.05 signify normality. The results on normality of observed variables is presented in table 4.2.

Table 4. 2: Shapiro-Wilk W Test for Normal Data

Variable	Obs	W	V	z	Prob>z
AQ	73	0.250	47.755	8.427	0.000
CA	73	0.265	46.840	8.385	0.000
PR	73	0.834	10.600	5.146	0.000
LQ	73	0.790	13.382	5.654	0.000
OE	73	0.592	25.996	7.102	0.000

Independent variable: AQ= Asset quality, CA= capital adequacy, PR= profitability, LQ= liquidity
Dependent variable: OE= operational efficiency

All the p-values were less than 0.05 level of significance implying the data was not normally distributed. Therefore, the classical least squares assumption of normality was violated hence classical least squares model was not appropriate for estimation of parameters. The study therefore adopted panels corrected standard errors (PCSEs) model proposed by Prais and Winsten.

4.3.2 Autocorrelation Test

Ordinary least squares (OLS) regression model requires that there is practically no autocorrelation in the data. Wooldridge tests was used to test for autocorrelation. A p-value greater than 0.05 signifies absence of autocorrelation (Wang, 2006). The results is presented in Table 4.3

Table 4. 3: Wooldridge Test for Autocorrelation

```
Wooldridge test for autocorrelation in panel data
H0: no first order autocorrelation
    F(  1,      12) =    113.393
           Prob > F =      0.0000
```

The p-value was less than .05 level of significance signifying presence of autocorrelation.

The null hypothesis that that there is no first order autocorrelation ($AR(1)^{1}$). The study therefore adopted panels corrected standard errors (PCSEs) model proposed by Prais and Winsten to handle the problem of first order autocorrelation and heteroscedasticity in data.

4.3.3 Multicolliniarity Test

Presence of multicollinearity was assessed based on Variance inflation factor (VIF) test. VIF greater than Ten (10) is an indication that multicollinearity may be present. The study findings on multicolliniarity is presented in table 4.4.

Table 4. 4: Variance inflation factor

	VIF	1/VIF
CA	7.448	.134
AQ	6.739	.148
PR	1.275	.784
LQ	1.012	.988
Mean VIF	4.118	.

Independent variable: AQ= Asset quality, CA= capital adequacy, PR= profitability, LQ= liquidity
Dependent variable: OE= operational efficiency.

All the variables had VIF values less than 10 (CA=7.448, AQ= 6.739, PR= 1.275, LQ= 1.012) and the mean VIF was 4.118 also less than 10 implying multicolliniarity was not a problem. The classical least squares assumption of no multicolliniarity was not violated hence the model could adopt OLS regression, however all the other assumptions of OLS need not to be violated for the study to adopt OLS.

4.3.4 Heteroscedasticity Test

The study employed Modified Wald test to examine the existence of heteroscedasticity where p-values less than 0.05 shows that heteroscedasticity is present in the data. The findings are presented in table 4.5.

Table 4. 5: Modified Wald test for Heteroscedasticity

```
Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i

chi2 (13)  =   74683.04
Prob>chi2 =      0.0000
```

The study Modified Wald test for Heteroscedasticity showed that the p-value was less than .05 level of significance. The study there rejected the null hypothesis that there was constant variance. The least squares regression assumptions of homoscedasticity was violated hence the study rejected the OLS and adopted Prais-Winsten regression, correlated panels corrected standard errors (PCSEs)

4.3.5 Cointegration

This is necessary to investigate the long-run relationship among the co integrating variables. The null hypothesis follows no co integration equations or simply no existence of co integration among the individual units of the study. Augmented Dickey-Fuller Test Equation was performed with the assumption of no deterministic trend. The test estimation of co integration models lead to the model output showing coefficients, standard error, t-statistic and p-values. The study findings are presented in table 4.6

Table 4. 6: Kao test for cointegration

Ho: No cointegration		Number of panels	= 13
Ha: All panels are cointegrated		Avg. number of periods	= 3.6154
Cointegrating vector: Same			
Panel means:	Included	Kernel:	Bartlett
Time trend:	Not included	Lags:	1.23 (Newey-West)
AR parameter:	Same	Augmented lags:	1
		Statistic	**p-value**
Dickey-Fuller t		-7.7050	0.0000
Augmented Dickey-Fuller t		-5.6299	0.0000
Unadjusted modified Dickey-Fuller t		-1.8591	0.0315
Unadjusted Dickey-Fuller t		-7.9817	0.0000

The result output from ADF Test equation as shown in Tables 4.6 indicate that since the probability value is less that the critical value of 0.05, then it suggests that the null hypothesis of no co integration is rejected (pvalue=0.000) This implies that the study variables are con integrated in the long run.

4.4 Correlation

The study sought to examine the association between bank financial soundness and operational efficiency. The study adopted Pearson correlation coefficient to the correlation between bank financial soundness and operational efficiency. The findings are presented in table 4.6

Table 4. 7: Pairwise Correlation Coefficient

Variables	AQ	CA	PR	LQ	OE
AQ	1.000				
CA	-0.003 0.983	1.000			
PR	-0.125 0.294	0.098 0.410	1.000		
LQ	0.384* 0.001	0.533* 0.000	-0.017 0.885	1.000	
OE	-0.116 0.328	0.143 0.226	-0.774* 0.000	0.154 0.193	1.000

* shows significance at the .05 level

Independent variable: AQ= Asset quality, CA= capital adequacy, PR= profitability, LQ= liquidity
Dependent variable: OE= operational efficiency.

The correlation between asset quality ratio and operational efficiency ratio was inverse (r= -.116, p=.328>.05). The correlation between capital Adequacy ratio and operational efficiency ratio was positive (r= .143,p= .226>.05). The correlation between profitability ratio and operational efficiency ratio was inverse (r= -774, p=.000<.05). The correlation between liquidity ratio and operational efficiency ratio was positive (r=.154, p=.193>.05).

4.5 Regression Analysis

The study sought to examine the effect of bank financial soundness on operational efficiency of deposit taking MFBs in Kenya. The study adopted panels corrected standard errors (PCSEs) regression developed by Prais-Winsten regression. The fixed effect model was rejected given the classical least squares assumptions were violated. Panels corrected standard errors (PCSEs) is used when residuals are not normal, heteroskedastic, serially correlated and shows contemporaneous cross sectional dependence. The regression results are presented in table 4.8

Table 4. 8: Panels Corrected Standard Errors (PCSEs) Regression

OE	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
AQ	-2.870	0.503	-5.71	0.000	-3.856	-1.884	***
CA	1.685	0.652	2.59	0.010	0.407	2.963	**
PR	-11.841	0.765	-15.48	0.000	-13.340	-10.342	***
LQ	0.732	0.107	6.85	0.000	0.523	0.941	***
Constant	0.792	0.232	3.41	0.001	0.337	1.247	***
Mean dependent var		1.932	SD dependent var			2.047	
R-squared		0.651	Number of obs			73.000	
Chi-square		369.526	Prob > chi2			0.000	

**** p<0.01, ** p<0.05, * p<0.1*

Independent variable: AQ= Asset quality, CA= capital adequacy, PR= profitability, LQ= liquidity. Dependent variable: OE= operational efficiency.

The model summary shows that the coefficient of determination (R^2) was .651 implying that the model explains 65.1% of the variation in operational efficiency with the remaining 34.9% of the remaining variation in operational efficiency being explained by unobserved variables that were not part of the current model. The Analysis of Variances (ANOVA) showed that bank financial soundness had a significant effect on operational efficiency MFBs in Kenya (F= 369.526, p= .000 <.05). Additionally, the regression coefficients revealed showed the effect of individual bank financial soundness indicators on operational efficiency of MFBs in Kenya.

The effect of asset quality on operational efficiency was negative and statistically significant (β_1= -2.870, t= -5.71,p= .000< .05). The effect of capital adequacy on operational efficiency was positive and statistically significant (β_2=1.685, t= 2.59, p=0.010<.05). The study also showed that profitability had a statistically significant negative effect on operational efficiency (β_3=-

11.841, t=-15.48, p=.000<.05). The effect of bank liquidity on operational efficiency was statistically significant and positive (β_4= 0.732, t= 6.85, p= .000<.05).

4.6 Discussion of Findings

The study examined the effect of bank financial soundness on operational efficiency of deposit taking MFBs in Kenya. The sub section provides the discussion of findings.

4.6.1 Effect of Asset Quality on Operational Efficiency

The study examined the effect of asset quality on operational efficiency of MFBs in Kenya. The study expected that increasing asset quality leads increasing operational efficiency of MFBs. Increasing assets quality is depicted by falling NPLs to total loans ratio while increasing operational efficiency is depicted by falling Operating cost to operating income ratio. The correlation analysis showed that the correlation between asset quality ratio and operational efficiency ratio was inverse (r= -.116, p=.328>.05). Implying that falling assets quality was associated with rising operational efficiency. Further, the regression analysis showed that the effect of asset quality ratio on operational efficiency ratio was negative and statistically significant (β1= -2.870, t= -5.71, p= .000< .05) implying that falling asset quality led to improving operational efficiency. The relationship can be explained by the fact that MFBs that had high NPL as a ratio of total loans had also offered more loans in absolute terms hence may have also enjoyed lower operating costs given the bulk lending. Additionally, the study adopted gross NPLs for measuring loan quality before adjustments for loan loss provision and loans whose interest payment were frozen hence some of the loans that may seem non performing may actually be performing after making necessary adjustments.

The study findings is based on empirical literature. The findings are in agreement with Kariuki (2016) who established that asset quality had a direct impact on intermediation efficiency. The findings are in conflict with Batir, Volkman and Gungor (2017) who showed that the causal effect association between NPLs and efficiency was inverse. Additionally, Kubai (2016) revealing that the association between operational efficiency and NPLs was inverse. Gulati, Goswami and Kumar, (2019) established inverse causal effect link between NPLs and operational efficiency given that high NPLs means banks would apply credit rationing at high interest rate hence making financial intermediation to be inefficient. Piskorski, Seru and Witkin

(2015) noted that banks that had high level of NPLs also tended to be less efficient compared to their counter parts that had lower NPLs to gross loans ratio. Odunga, Nyangweso, Carter and Mwarumba (2013) showed that credit risk that measures assets quality had a major inverse effect on operating efficiency of banking financial institutions.

4.6.2 Effect of Capital adequacy on Operational Efficiency

The study also examined the effect of capital adequacy on operational efficiency of deposit taking MFBs in Kenya. The study expected that increasing capital adequacy leads to increasing operational efficiency of MFBs. Increasing capital adequacy is depicted by increasing equity to total assets ratio while increasing operational efficiency is depicted by falling operating cost to operating income ratio. The correlation analysis revealed that correlation between Capital adequacy ratio and operational efficiency ratio was positive ($r= .143$, $p= .226>.05$). The positive correlation implies that increasing capital adequacy was accompanied by falling operational efficiency. Additionally, regression analysis revealed that the effect of capital adequacy ratio on operational inefficiency ratio was positive and statistically significant ($\beta2=1.685$, $t= 2.59$, $p=0.010<.05$). The positive effect of capital adequacy ratio on operational efficiency ratio implies that strengthening of equity as a ratio of total assets leads to falling operational efficiency. The relationships can be explained by the fact that most of the banks that had high equity total assets ratio also tended to be inefficient given that they were relying much on own finances and less on borrowed finances. Such banks with high capital- total assets ratio could not cost effectively offer loans compared to their counter parts that had leveraged their operations through deposits from the public.

The findings are in congruence with Banna, Ahmad and Koh (2017) who revealed that capital adequacy affected efficiency of the institutions studied. Additionally, Olarewaju (2016) noted that capital adequacy had a major effect on operational efficiency. Mohammed (2018) also revealed that capital adequacy inversely influenced efficiency of banks studied. The findings however, are in conflict with Bitar, Pukthuanthong and Walker (2018) who showed that capital adequacy and risk weighted capital ratios enhanced banking efficiency. Shaddady and Moore (2019) while agreeing with Bitar, Pukthuanthong and Walker (2018) showed that capital adequacy were directly associated with banking institutions efficiency.

4.6.3 Effect of Profitability on Operational Efficiency

The study also examined the effect of profitability on operational efficiency. The study expected that increasing profitability leads to increasing operational efficiency of MFBs. Increasing profitability is depicted by increasing NPAT to total assets ratio while increasing operational efficiency is depicted by falling operating cost to operating income ratio. The correlation analysis revealed that the correlation between profitability and operational efficiency ratio was inverse (r= -774, p=.000<.05) implying that increasing profitability was a companied by increasing operational efficiency. The regression analysis also revealed that profitability had a statistically significant negative effect on operational efficiency ratio (β3=-11.841, t=-15.48, p=.000<.05). The negative effect implies that increasing profitability leads to increasing operational efficiency. The negative causal effect relationship can be explained by the fact that increasing profitability as a ratio of total assets implies falling operational cost to income ratio and increasing operational efficiency. Microfinance banks that were more profitable also tended to be more cost efficient as improving profitability could only be achieved if operating costs fall as a ratio of total operating income generated.

The study findings are supported by Seyedi and Abdoli (2019) who showed that profitability affected the financial soundness of banks as well as operational efficiency. Maghyereh and Awartani (2014) also revealed direct relationship between profitability proxies and operational efficiency of banking institutions. Alrafadi, Kamaruddin and Yusuf (2014) also revealed that there was direct causal effect relationship between bank efficiency and ROA. The relationship was positive in that more profitable banks are able to attract deposit funding which is relatively cheaper compared to wholesale funding hence they are cost efficient. However, other scholars such as Gulati, Goswami and Kumar (2019) found a negative relationship. Goswami and Kumar (2019) established an inverse relationship between profitability and cost efficiency. Goswami and Kumar (2019) revealed further that the inverse relationship is because most cost efficient banks were those that has invested large resources in use of technology to drive down costs hence that negatively affected their profitability in the short run period.

4.6.4 Effect of Liquidity on Operational Efficiency

The research also examined the effect of bank liquidity on operational efficiency of MFBs in Kenya. The study expected that increasing bank liquidity lead to increasing operational

efficiency of MFBs. Increasing bank liquidity shown by increasing liquid assets to customers deposits ratio while increasing operational efficiency is depicted by falling operating cost to operating income ratio. The Pearson correlation coefficient established that the correlation between liquidity ratio and operational efficiency ratio was positive ($r=.154$, $p=.193>.05$) implying that increasing liquidity was accompanied by falling operational efficiency. Further, the regression analysis revealed that the effect of bank liquidity ratio on operational efficiency ratio was statistically significant and positive ($\beta 4= 0.732$, $t= 6.85$, $p= .000<.05$) implying that increasing bank liquidity led to falling operational efficiency of MFBs. The relationship can be explained by the fact that banks that had more liquidity may have not invested the funds into interest baring short-term assets or offered them as loans hence their operational efficiency was falling.

The study findings are in agreement with Osazefua (2019) who establish inverse link between efficiency and liquidity of commercial banking firms in Malesia. The study explained that banks were holding high liquidity at the expense of opportunities that the money could earn the bank if it were invested in income bearing assets. Sakouvogui and Shaik (2020) also revealed that the causal effect link between liquidity and cost efficiency was inverse. The inability of banking institutions to settle its maturing obligations may result to bank ran hence and loss of credit worthiness by the bank and associated legal liability on negation of contractual agreements (Adam, Safitri & Wahyudi, 2018). The findings are however in conflict with Gao (2016) who noted that there was direct causal effect link between efficiency and liquidity. Kariuki (2016) also established that liquidity did not affect financial intermediation efficiency.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The chapter presents the summary of findings, conclusion, recommendations, limitations and areas for further studies.

5.2 Summary of Findings

The section presents the findings based on correlation and regression analysis. The findings have been presented in terms of interaction between bank financial soundness indicators and operational efficiency of deposit taking MFBs in Kenya.

The study examined the effect of asset quality on operational efficiency of MFBs in Kenya. The expectation was increasing asset quality leads to increasing operational efficiency of MFBs. The correlation analysis showed that the correlation between asset quality ratio and operational efficiency ratio was inverse implying that falling assets quality was associated with rising operational efficiency. Further, the regression analysis showed that the effect of asset quality ratio on operational efficiency ratio was negative and statistically significant implying that falling asset quality led to improving operational efficiency.

The study also examined the effect of capital adequacy on operational efficiency of deposit taking MFBs in Kenya. The study expected that increasing capital adequacy leads to increasing operational efficiency of MFBs. The correlation analysis revealed a positive correlation which implies that increasing capital adequacy was accompanied by falling operational efficiency. Additionally, regression analysis revealed that the effect of capital adequacy ratio on operational inefficiency ratio was positive and statistically significant. The positive effect of capital adequacy ratio on operational efficiency ratio implies that strengthening of equity as a ratio of total assets leads to falling operational efficiency.

The study also examined the effect of profitability on operational efficiency; where an increase in profitability was expected to bring about an increase in the operational efficiency of MFBs. The correlation analysis revealed that the correlation between profitability ratio and operational efficiency ratio was inverse implying that increasing profitability was accompanied by increasing operational efficiency. The regression analysis also revealed that profitability had a statistically

significant negative effect on operational efficiency ratio. The negative effect implies that increasing profitability leads to increasing operational efficiency.

The research further examined the effect of bank liquidity on operational efficiency of MFBs in Kenya. It was expected that increasing bank liquidity would lead to increasing operational efficiency of MFBs. The Pearson correlation coefficient established that the correlation between liquidity ratio and operational efficiency ratio was positive implying that increasing liquidity was accompanied by falling operational efficiency. Further, the regression analysis revealed that the effect of bank liquidity ratio on operational efficiency ratio was statistically significant and positive implying that increasing bank liquidity led to falling operational efficiency of MFBs.

5.3 Conclusion

The study makes a number of conclusions regarding the causal effect relationships established between bank financial soundness and operational efficiency. Regarding the effect of assets quality on operational efficiency, the study concluded that falling asset quality led to improving operational efficiency. The inverse relationship may be because deposit-taking MFBs that had high NPL as a ratio of total loans had also offered more loans in absolute terms hence may have also enjoyed lower operating costs given the bulk lending. Furthermore, the study adopted gross NPLs for measuring loan quality before adjustments for loan loss provision and loans whose interest payment were frozen hence some of the loans that may seem non performing may actually be performing after making necessary adjustments. The gross nonperforming loans after adjustment for loans whose interest had been frozen and the provision for loan losses mean the net NPLs would be lower as a ratio of Total loans hence increasing operational efficiency of MFBs in Kenya.

Concerning the effect of capital adequacy on operational efficiency of deposit taking MFBs in Kenya, the study concluded that increasing equity as a ratio of total assets leads to falling operational efficiency. The relationships is due to the fact that most of the banks that had high equity to total assets ratio also tended to be inefficient given that they were relying much on own finances and less on borrowed finances. Such banks with high capital- total assets ratio could not cost effectively offer loans compared to their counter parts that had leveraged their operations through deposits from the public. Additionally, banks that had high equity to total assets ratio

also relied less on deposits financing hence they incurred high taxation costs leading to high operating cost to operating income ratio.

Regarding the effect profitability on operational efficiency of MFBs in Kenya, The study concluded that increasing profitability leads to increasing operational efficiency. The positive causal effect relationship can be explained by the fact that increasing profitability as a ratio of total assets implies falling operational cost to income ratio and increasing operational efficiency. Microfinance banks that were more profitable also tended to be more cost efficient as improving profitability could only be achieved if operating costs fall as a ratio of total operating income generated.

Finally, with respect to effect of bank liquidity on operational efficiency of MFBs in Kenya, the study concluded that that increasing bank liquidity led to falling operational efficiency of MFBs. The relationship can be explained by the fact that banks that had more liquidity may have not invested the funds into interest baring short-term assets or offered them as loans hence their operational efficiency was falling. The banks ought to hold just enough noninterest bearing liquidity any excess leads to foregone interest income and high cost of cash management costs.

5.4 Recommendations

The study findings have implications for practice and policy purposes. Given that falling asset quality was associated with rising operational efficiency, the study recommends to management of MFBs in Kenya to continue offering loans high value and quality assets to be able to increase the operational efficiency of the banking intuitions. Additionally, the MFBs should allocate high provision for loan losses that ensures that the actual loan losses are adequately covered by the loan loss provision. The study also recommends to CBK to continue tightening assets quality and loan provisioning requirements to ensure that most if not all non-performing loans are recovered such that they do not turn into loan losses. The regulators must base the assets quality classification on risk adjusted assets.

Regarding the conclusion, that increasing equity as a ratio of total assets leads to falling operational efficiency of MFBs in Kenya, the study suggest to management of MFBs in Kenya actively seeks deposit financing. As long as the minimum capital requirement is not breached, the banking institutions should take on more leverage through deposit financing and rely less on

equity funding. Banks relying much on deposit financing also enjoys lower costs in terms of cost of funds and cost savings in terms of corporate tax since the interest on deposits is deducted from operating income before tax is deducted hence the firm effectively pays less tax than if it relied more on owners equity. The study also recommends to the CBK to closely monitor the despots funding structure of MFBs to ensure they adopt optimal leverage that ensures that their average costs are at minimal.

Given the conclusion that increasing profitability leads to increasing operational efficiency, the study suggests to management of MFBs in Kenya to continue innovating new products that translates to income growth. The banks should offer a variety of credit facilities that leads to increasing profitability. Additionally, the MFBs should implement lean operations through adoption of cost saving and efficiency enhancing technologies. One area of technology they can adopt aggressively in mobile lending that lowers operational cost thereby improving their operational efficiencies. The study also suggest to CBK to proactively approve new products by the MFBs and encourage them to adopt banking technologies that enhances cost efficiency of the said MFBs.

Finally, regarding the conclusion that increasing bank liquidity led to falling operational efficiency of MFBs, the study suggest to management of MFBs to hold optimal liquidity. The excess liquidity ought to be invested into interest baring short-term assets or offered as loans to earn more revenues and lower their operating expense to operating income ratio. The banks ought to hold just enough noninterest bearing liquidity any excess leads to foregone interest income and high cost of cash management costs. The study also recommends to the regulator, CBK, to watch closely the liquidity requirements of the MFBs. The banks should strictly require that excess liquidity be deposited with the regulator as cash reserves.

5.5 Limitations of the Study

Even though successfully carried out, the study has a few limitations. First, the study only concentrated in four indicators of bank financial soundness. There are other bank soundness indicators that were not covered in the study. Decisions making based on study parameter estimates should be done while taking into consideration that the indicators of banks financial

soundness were not comprehensively covered and a comprehensive study covering all possible indicators may yield significantly different findings.

Secondly, the study was limited to MFBs licensed by CBK hence the findings have limited application among MFBs. Manager of financial institutions that do not fall in the category of MFBs in Kenya should apply the findings with caution. A study in the commercial banks institutions and Sacco may yield different parameter estimates hence different decision making regarding bank financial soundness.

The study also used one proxy for the indicators of bank financial soundness and operational efficiency. Sometimes different proxies measuring same variable may yield conflicting results. Decision-making based on study findings should be done with caution before comprehensive proxies are used in the same study for purpose of comparison.

The study also relied wholly on secondary data provided by the central banks of Kenya. The secondary data may not capture all aspects of bank financial soundness and operational efficiency. The findings based on the secondary data should be applied together with other qualitative information before decision-making is made regarding bank financial soundness and operational efficiency.

5.6 Areas for further studies

The current study was on the effect of bank financial soundness on operational efficiency of MFBs in Kenya. A number of knowledge gaps still exist that should be investigated by future researcher. First, the study only concentrated in four indicators of bank financial soundness. The study recommends that future studies should be carried out with indicators of bank financial soundness indicators that were not covered in the study. Financial soundness indicators such as loan growth and management efficiency should be used in future estimation models.

Secondly, the study was limited to MFBs licensed by CBK hence the findings have limited application among MFBs. The study recommends to future researcher that should carry out the same study in different financial institutions that do not fall in the category of MFBs in Kenya. A study in the commercial banks, deposit-taking Sacco’s and nondeposit taking Sacco’s and

lending only micro finance institutions for the purpose of comparison of findings and improving the application of findings for decision making across financial institutions.

The study also used one proxy for each indicators of bank financial soundness and operational efficiency. Sometimes different proxies measuring same variable may yield conflicting results. The study thus suggest to future researchers to adopt different proxies for bank financial soundness indicators and operational efficiency. The future researcher can also adopt Data envelopment analysis that measures the technical efficiency for purpose of analysis.

The study also relied wholly on secondary data provided by the central banks of Kenya. The secondary data may not capture all aspects of bank financial soundness and operational efficiency. The study thus recommends that future studies should be based on both secondary and qualitative information collected using primary data collection tools. Different data sources would act as triangulation for each other hence enhancing the quality of data as well as quality of findings of the study.

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APPENDICES

Appendix I: Data Collection Sheets

MFB Name ..... MFB ID .....

Variable /Year	Proxies	2014	2015	2016	2017	2018	2019
Asset quality	NPLs						
	Total Loan						
Capital Adequacy	Equity						
	total Assets						
Profitably	NPAT						
	Total Assets						
Liquidity	Liquid Assets						
	Deposits						
Operational Efficiency	Operational income						
	operational Expenses						

Appendix II: Deposit taking Micro Finance Banks licensed by Central Bank of Kenya

1. Kenya Women Microfinance Bank Limited
2. Faulu Microfinance Bank Limited
3. SMEP Microfinance Bank Limited
4. Rafiki Microfinance Bank Limited
5. REMU Microfinance Bank Limited
6. Century Microfinance Bank Limited
7. U & I Microfinance Bank Limited
8. Uwezo Microfinance Bank Limited
9. Sumac Microfinance Bank Limited
10. Caritas Microfinance Bank Limited
11. Choice Microfinance Bank Limited
12. Daraja Microfinance Bank Limited
13. Maisha Microfinance Bank Ltd

Appendix III: Study Variables

MFBs	Year	id	AQ	CA	PR	LQ	OE
Carritas	2014	1	-	-	-	-	-
Carritas	2015	1	0	0.473118	-0.32258	1.529412	7
Carritas	2016	1	0	0.472125	-0.12892	1.219512	2.947368
Carritas	2017	1	0.05698	0.31058	-0.08077	0.753982	1.795455
Carritas	2018	1	0.071904	0.211415	-0.06833	0.379015	1.518987
Carritas	2019	1	0.071904	0.211415	-0.06833	0.379015	1.518987
Century Microfinance Bank Limited	2014	2	0.186916	0.329004	-0.14719	0.162963	2.21875
Century Microfinance Bank Limited	2015	2	0.607595	0.269036	-0.26904	0.295238	2.348837
Century Microfinance Bank Limited	2016	2	0.28972	0.137778	-0.18222	0.106383	1.891304
Century Microfinance Bank Limited	2017	2	0.533981	0.045139	-0.21875	0.36036	2.657895
Century Microfinance Bank Limited	2018	2	0.25641	0.153132	-0.058	0.454545	1.304878
Century Microfinance Bank Limited	2019	2	0.25641	0.153132	-0.058	0.454545	1.304878
Choice	2014	3					
Choice	2015	3	0	0.74026	-0.37662	0.823529	14.33333
Choice	2016	3	0.114286	0.377049	-0.28689	0.424242	5.454545
Choice	2017	3	0.193548	0.272059	-0.27941	0.234568	3.736842
Choice	2018	3	0.409091	-0.30612	-0.42857	0.138889	5.142857
Choice	2019	3	0.409091	-0.30612	-0.42857	0.138889	5.142857
Daraja	2014	4					
Daraja	2015	4	0	0.807229	-0.54217	0.428571	5.375
Daraja	2016	4	0.137255	0.455556	-0.15556	0.705882	3.705882
Daraja	2017	4	0.207547	0.309524	-0.27976	0.242105	4
Daraja	2018	4	0.333333	0.133721	-0.18605	0.214876	2.833333
Daraja	2019	4	0.333333	0.133721	-0.18605	0.214876	2.833333
Faulu Microfinance Bank Limited	2,014	5	0.054736	0.186368	0.014715	0.021234	0.807316
Faulu Microfinance Bank Limited	2,015	5	0.036903	0.16976	0.004541	0.301498	0.897359
Faulu Microfinance Bank Limited	2016	5	0.092286	0.158647	0.001571	0.225663	0.900581
Faulu Microfinance Bank Limited	2017	5	0.168003	0.177098	0.005647	0.132948	0.845046
Faulu Microfinance Bank Limited	2018	5	0.148037	0.127236	0.006648	0.224012	0.839066
Faulu Microfinance Bank Limited	2,019	5	0.146637	0.128811	0.011122	0.153014	0.912315
KWFT	2,014	6	0.054736	0.170687	0.017565	0.125791	0.822633
KWFT	2,015	6	0.115778	0.147265	0.012398	0.350893	0.829282
KWFT	2016	6	0.17405	0.147918	0.006967	0.366519	0.814303
KWFT	2017	6	0.21023	0.162697	0.000657	0.346952	0.855314
KWFT	2018	6	0.215082	0.137617	-0.02796	0.332548	1.041625
KWFT	2019	6	0.210717	0.126868	-0.01325	0.383967	0.936269
Maisha	2,014	7					
Maisha	2,015	7					

Maisha	2016	7	0.037037	0.520468	-0.18129	1	5.6
Maisha	2017	7	0.102564	0.221854	-0.13907	0.246753	2.351351
Maisha	2018	7	0.471014	0.027682	-0.41176	0.263359	3.163636
Maisha	2019	7	0.471014	0.027682	-0.41176	0.263359	3.163636
Rafiki Microfinance Bank Limited	2014	8	0.089819	0.16954	0.003515	0.10432	0.884536
Rafiki Microfinance Bank Limited	2,015	8	0.120375	0.134946	0.003752	0.661895	0.884173
Rafiki Microfinance Bank Limited	2016	8	0.346627	0.101679	-0.04067	0.99397	1.270936
Rafiki Microfinance Bank Limited	2017	8	0.596989	0.061989	-0.04891	0.973455	1.435768
Rafiki Microfinance Bank Limited	2018	8	0.724568	0.211736	-0.03174	0.755556	1.261519
Rafiki Microfinance Bank Limited	2019	8	0.724568	0.211736	-0.03174	0.755556	1.261519
REMU Microfinance Bank Limited	2014	9	0.25	0.526582	0.007595	0.097143	0.942029
REMU Microfinance Bank Limited	2015	9	0.284047	0.491184	-0.03778	0.550633	1.276316
REMU Microfinance Bank Limited	2016	9	0.340164	0.508287	-0.03315	0.59434	1.1
REMU Microfinance Bank Limited	2017	9	0.353211	0.471751	-0.04802	0.548387	1.246377
REMU Microfinance Bank Limited	2018	9	0.4329	0.353349	-0.03233	0.861789	1.438356
REMU Microfinance Bank Limited	2019	9	0.4329	0.353349	-0.03233	0.861789	1.438356
SMEP	2014	10	0.153517	0.233389	-0.04079	0.078813	1.114679
SMEP	2015	10	0.188657	0.248843	-0.00039	0.273504	0.94822
SMEP	2016	10	0.200358	0.200451	-0.05039	0.322536	1.165202
SMEP	2017	10	0.188432	0.183248	-0.0117	0.280025	1.094139
SMEP	2018	10	0.197936	0.174371	-0.00748	0.347574	0.93578
SMEP	2019	10	0	0.152103	0.001893	0.298798	0.976733
SUMAC	2014	11	0.15917	0.484615	0.010256	0.242188	0.888889
SUMAC	2015	11	0.180139	0.340461	0.011513	0.437037	0.748148
SUMAC	2016	11	0.061338	0.306351	0.017435	0.283262	0.716418
SUMAC	2017	11	0.085072	0.220756	0.004398	0.566586	0.719828
SUMAC	2018	11	0.385201	0.208497	0.003268	0.56	0.593651
SUMAC	2019	11	0.385201	0.208497	0.003268	0.56	0.593651
U & I Microfinance Bank Limited	2014	12	0.083333	0.605839	0.014599	0.576923	0.851852
U & I Microfinance Bank Limited	2015	12	0.077465	0.581522	0.038043	0.474576	0.714286
U & I Microfinance Bank Limited	2016	12	0.051661	0.336182	0.019943	0.263158	0.757576
U & I Microfinance Bank Limited	2017	12	0.089231	0.399015	0.027094	0.205	0.784314
U & I Microfinance Bank Limited	2018	12	0.103837	0.316479	0.014981	0.207018	0.798165
U & I Microfinance Bank Limited	2,019	12	0.048018	0.252079	0.006082	0.167189	0.827245
Uwezo Microfinance Bank Limited	2014	13	0.256	0.5125	0.00625	0.15625	0.945946
Uwezo Microfinance Bank Limited	2015	13	0.443299	0.79646	0.000885	2.309524	0.96
Uwezo Microfinance Bank Limited	2016	13	0.490066	0.836449	0.018692	0.482759	0.946429
Uwezo Microfinance Bank Limited	2017	13	0.722222	0.79717	-0.04245	1.551724	1.26087
Uwezo Microfinance Bank Limited	2018	13	0.696296	0.631111	-0.12	1.625	1.72093
Uwezo Microfinance Bank Limited	2019	13	0.696296	0.631111	-0.12	1.625	1.72093

Appendix IV: Raw Data

MFBs	year	AQ		CA		ROA		LIQ		income	expense
		NPLs	T.loans	Equity	TA	NPAT	TA	C.Assest	Deposits		
Carritas	2014										
Carritas	2015		11	88	186	-60	186	130	85	10	70
Carritas	2016	0	141	271	574	-74	574	350	287	38	112
Carritas	2017	20	351	273	879	-71	879	426	565	88	158
Carritas	2018	54	751	263	1244	-85	1244	354	934	158	240
Carritas	2019	58.86	818.59	286.67	1355.96	-92.65	1355.96	385.86	1018.06	172.22	261.6
Century Microfinance Bank Limited	2014	20	107	76	231	-34	231	22	135	32	71
Century Microfinance Bank Limited	2015	48	79	53	197	-53	197	31	105	43	101
Century Microfinance Bank Limited	2016	31	107	31	225	-41	225	15	141	46	87
Century Microfinance Bank Limited	2017	55	103	13	288	-63	288	80	222	38	101
Century Microfinance Bank Limited	2018	50	195	66	431	-25	431	155	341	82	107
Century Microfinance Bank Limited	2019	54.5	212.55	71.94	469.79	-27.25	469.79	168.95	371.69	89.38	116.63
Choice	2014										
Choice	2015		19	57	77	-29	77	14	17	3	43
Choice	2016	4	35	46	122	-35	122	28	66	11	60
Choice	2017	6	31	37	136	-38	136	19	81	19	71
Choice	2018	9	22	-30	98	-42	98	15	108	14	72
Choice	2019	9.81	23.98	-32.7	106.82	-45.78	106.82	16.35	117.72	15.26	78.48
Daraja	2014										
Daraja	2015		36	67	83	-45	83	6	14	8	43
Daraja	2016	7	51	82	180	-28	180	60	85	17	63

Daraja	2017	11	53	52	168	-47	168	23	95	20	80
Daraja	2018	14	42	23	172	-32	172	26	121	24	68
Daraja	2019	15.26	45.78	25.07	187.48	-34.88	187.48	28.34	131.89	26.16	74.12
Faulu Microfinance Bank Limited	2014	1032	18854	3787	20,320	299	20,320	297	13,987	3,882	3,134
Faulu Microfinance Bank Limited	2015	612	16,584	4,299	25324	115	25324	5032	16,690	4,355	3,908
Faulu Microfinance Bank Limited	2016	1657	17955	4342	27,369	43	27369	3920	17371	4818	4339
Faulu Microfinance Bank Limited	2017	2849	16958	4485	25325	143	25325	2187	16450	4653	3932
Faulu Microfinance Bank Limited	2018	2507	16935	3464	27225	181	27225	4019	17941	4797	4025
Faulu Microfinance Bank Limited	2019	2900	19,777	3,823	29,682	330	29681.99	2989.693	19538.74	5,475	4,995
KWFT	2014	1032	18854	4606	26,985	474	26985	2148	17,076	6,433	5,292
KWFT	2015	2,558	22,094	4,692	31861	395	31861	6248	17,806	7,363	6,106
KWFT	2016	3862	22,189	4756	32,153	224	32153	6288	17156	7523	6126
KWFT	2017	4073	19,374	4707	28931	19	28931	5681	16374	7029	6012
KWFT	2018	4301	19,997	4071	29582	-827	29582	5367	16139	5958	6206
KWFT	2019	3997.8	18972.4	3845.7	30312.5	-401.5	30312.5	6056.7	15774	5983	5601.7
Maisha	2014										
Maisha	2015										
Maisha	2016	1	27	89	171	-31	171	78	78	10	56
Maisha	2017	16	156	67	302	-42	302	57	231	37	87
Maisha	2018	65	138	8	289	-119	289	69	262	55	174
Maisha	2019	70.85	150.42	8.72	315.01	-129.71	315.01	75.21	285.58	59.95	189.66
Rafiki Microfinance Bank Limited	2014	307	3418	1013	5,975	21	5,975	297	2,847	970	858
Rafiki Microfinance Bank Limited	2015	514	4,270	1,043	7729	29	7729	2774	4,191	1,390	1,229
Rafiki Microfinance Bank Limited	2016	1269	3661	745	7,327	-298	7327	2967	2985	1218	1548
Rafiki Microfinance Bank Limited	2017	1705	2856	417	6727	-329	6727	2457	2524	794	1140

Rafiki Microfinance Bank Limited	2018	1973	2723	1281	6050	-192	6050	1734	2295	803	1013
Rafiki Microfinance Bank Limited	2019	2150.57	2968.07	1396.29	6594.5	-209.28	6594.5	1890.06	2501.55	875.27	1104.17
REMU Microfinance Bank Limited	2014	46	184	208	395	3	395	17	175	69	65
REMU Microfinance Bank Limited	2015	73	257	195	397	-15	397	87	158	76	97
REMU Microfinance Bank Limited	2016	83	244	184	362	-12	362	63	106	80	88
REMU Microfinance Bank Limited	2017	77	218	167	354	-17	354	68	124	69	86
REMU Microfinance Bank Limited	2018	100	231	153	433	-14	433	106	123	73	105
REMU Microfinance Bank Limited	2019	109	251.79	166.77	471.97	-15.26	471.97	115.54	134.07	79.57	114.45
SMEP	2014	251	1635	555	2378	-97	2378	77	977	654	729
SMEP	2015	326	1,728	645	2592	-1	2592	352	1,287	618	586
SMEP	2016	336	1677	533	2,659	-134	2659	468	1451	569	663
SMEP	2017	316	1677	501	2734	-32	2734	450	1607	563	616
SMEP	2018	326	1647	513	2942	-22	2942	659	1896	654	612
SMEP	2019		1,682	504	3,314	6	3,314	640.36	2,143	837.724	818.233
SUMAC	2014	46	289	189	390	4	390	31	128	108	96
SUMAC	2015	78	433	207	608	7	608	59	135	135	101
SUMAC	2016	33	538	246	803	14	803	66	233	201	144
SUMAC	2017	53	623	251	1137	5	1137	234	413	232	167
SUMAC	2018	354	919	319	1530	5	1530	280	500	315	187
SUMAC	2019	385.86	1001.71	347.71	1667.7	5.45	1667.7	305.2	545	343.35	203.83
U & I Microfinance Bank Limited	2014	7	84	83	137	2	137	30	52	27	23
U & I Microfinance Bank Limited	2015	11	142	107	184	7	184	28	59	42	30
U & I Microfinance Bank Limited	2016	14	271	118	351	7	351	55	209	66	50
U & I Microfinance Bank Limited	2017	29	325	162	406	11	406	41	200	102	80

U & I Microfinance Bank Limited	2018	46	443	169	534	8	534	59	285	109	87
U & I Microfinance Bank Limited	2019	29	602	173	686	4	686.405	59	355	117	97
Uwezo Microfinance Bank Limited	2014	32	125	82	160	1	160	10	64	37	35
Uwezo Microfinance Bank Limited	2015	43	97	180	226	0.2	226	97	42	50	48
Uwezo Microfinance Bank Limited	2016	74	151	179	214	4	214	14	29	56	53
Uwezo Microfinance Bank Limited	2017	91	126	169	212	-9	212	45	29	46	58
Uwezo Microfinance Bank Limited	2018	94	135	142	225	-27	225	26	16	43	74
Uwezo Microfinance Bank Limited	2019	102.46	147.15	154.78	245.25	-29.43	245.25	28.34	17.44	46.87	80.66