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AN EVALUATION OF THE EFFECT OF PRUDENTIAL REGULATIONS ON THE SOCIAL AND FINANCIAL PERFORMANCE OF MICROFINANCE BANKS IN KENYA

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REG. NUMBER: 102974

A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF SCIENCE IN DEVELOPMENT FINANCE AT STRATHMORE UNIVERSITY BUSINESS SCHOOL, NAIROBI

AUGUST 2022

DECLARATION

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other University. To the best of my knowledge and belief, the dissertation contains no material previously published or written by another person except where due reference is made in the dissertation itself.

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ABSTRACT

Appropriate regulation and supervision of microfinance is of critical importance in bringing the poor and vulnerable communities the financial services they need. However, pertinent concerns arise on how best to regulate and supervise this industry given its various specificities and broader social mission. Statistics show that most Microfinance Banks (MFBs) in Kenya have incurred losses since the licensing of the first institution in 2009 by the Central Bank. This study attempts to examine the effect of prudential regulations on social and financial performance of MFBs in Kenya. The study focuses on capital regulations, liquidity regulations, loan loss provisioning requirements and their effect on social and financial performance of MFBs in Kenya. This study is anchored on the microfinance schism and the public interest theory of regulation. To achieve the study's objectives, a descriptive research design is employed and the population comprises the 13 deposit taking microfinance institutions in Kenya as at 31st December 2020. The study uses unbalanced panel secondary data which was gathered through a data collection sheet for a period of seven years from 2014 to 2020. Data analyses were undertaken through descriptive and inferential statistics using the STATA statistical software. Inferential statistics entailed correlation analysis and the panel data regression analysis. With respect to financial performance, the study findings revealed that loan loss provisioning had a negative and significant effect on ROA, Capital adequacy had positive and significant effect on ROA and liquidity had a negative relationship with ROA. Bank size had a positive and significant effect on ROA while bank age had a positive effect on ROA though not statistically significant. With respect to social performance, the study findings revealed that Capital adequacy had a positive relationship with outreach, Liquidity had a positive and insignificant effect on outreach while LLP had a negative effect on outreach. Bank size had a negative and insignificant effect on outreach as Bank age had a positive and significant effect on outreach. Thus, to improve financial performance of the microfinance institutions considering their socio-economic importance, the management need to limit levels of non-performing loans that subsequently necessitates the loan loss provisions. Capital adequacy should be equally enhanced with regulatory requirements to enhance performance. Since size negatively affects outreach which is a social performance indicator, bigger MFIs should be encouraged to enhance their outreach initiatives as they take advantage of economies of scale. The levels of liquidity of the MFIs should also be improved to enhance outreach and subsequently accessibility.

DEDICATION

I wholeheartedly dedicate this study to my late Father *Jaduon'g* **Kamlus Oduor Madialo** for his dogmatic position on matters education and to my Mother Mrs. **Conslata Awino Oduor** for her dogmatic position on matters of child welfare. To my wife, daughters and son for being a source of inspiration and for continually providing moral, spiritual and emotional support and for making financial sacrifices. Ultimately to the Almighty God who gifted me my parents and family, strength, power of mind, protection, health and skills to come through.

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An undertaking of this nature is always a team effort and many people contributed in one way or the other among them Collins Kioko and Derick son of Mbalilwa.

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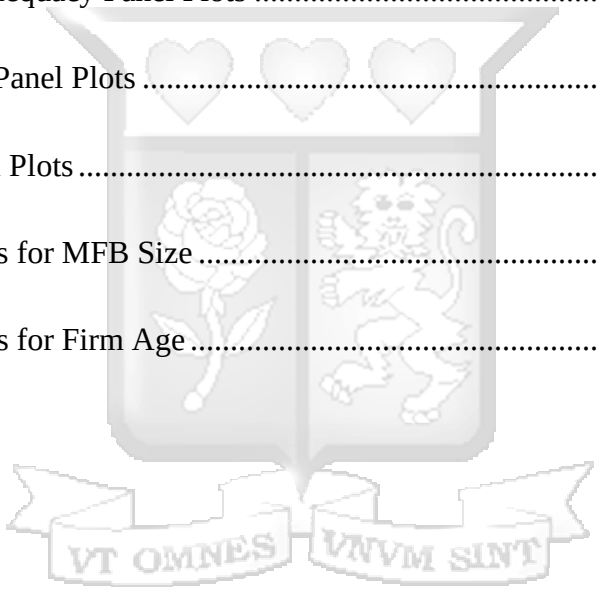

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LIST OF ACRONYMS AND ABBREVIATIONS

AMFI	Association of Microfinance Institutions
CAR	Capital Adequacy Ratio
CBK	Central Bank of Kenya
DTM	Deposit Taking Microfinances
GMM	Generalized Method of Moments
KWFT	Kenya Women Finance Trust
LCR	Liquidity Coverage Ratio
LLP	Loan Loss Provisioning
MFBs	Microfinance Banks
MFIs	Microfinance Institutions
NGOs	Non-Governmental Organizations
OLS	Ordinary Least Squares
OSS	Operational Self-Sufficiency Ratio
ROA	Return on Assets
ROE	Return on Equity
SACCOs	Savings and Credit Co-operatives
TCR	Total Capital Ratio
TRWA	Total Risk Weighted Assets
VIF	Variance Inflation Factors

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OPERATIONAL DEFINITION OF KEY TERMS

Capital Adequacy	This is requirement for MFIs to have a minimum amount of capital in proportion to the value of their assets (Apalia, 2017).
Capital Adequacy ratio	This is a measure of MFIs ability to absorb losses by calculating the ratio of capital to risk (Bouheni et al., 2014).
Liquidity	This is a requirement whereby MFIs must hold high amounts of quality liquid assets which are sufficient to finance cash outflows (Duijm & Wierts, 2016).
Loan Loss Provisioning	This is a provisioning methodology requiring MFIs to recognize a reduction in the realizable value of their loans (Alhadab & Alsahawneh, 2016).
Microfinance Business	Includes the provision of short-term loans to small or micro enterprises or low-income households and characterized by the use of collateral substitutes (Purkayastha et al., 2018).
Microfinance Bank (MFB)	Means a company which is licensed to carry on microfinance bank business (Almas & Mukhtar, 2015). **Note**: In some instances, the terms Microfinance Institution (s) and Microfinance Bank(s) have been used interchangeably and should be construed within the context.
Performance	This is the ability of a microfinance to attain its social and financial objectives for it to be sustainable (Barry & Tacneng, 2011).
Prudential regulation	Prudential framework which encompasses both the regulatory setting and the supervisory enforcement, which require financial firms to control their risk-taking and to hold adequate capital (and now also liquidity), with the

	purpose of ensuring the resilience of individual institutions and the stability of the financial system (Tchuigoua, 2014).
Regulation	A rule of order having the force of law, prescribed by a superior or competent authority, relating to the actions of those under the authority's control and are designed to guide the activity of those regulated by the agency and also the activity of the agency's employees (Karimu et al., 2019).

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The microfinance industry differs in many ways from the conventional banking industry. The characteristics of the clients are distinct, the credit methodology is different and, in many cases, the ownership structure of the institutions is not the same as that typically found in conventional financial institutions (Janson, Rosales & Westley, 2004). These factors give rise to a unique risk profile that needs to be addressed through adaptations in the regulatory framework and supervisory practices. In view of the foregoing, it is important for supervisory authorities to be familiar with the risks of the industry and to establish a simple and rational regulatory and supervisory framework aimed at facilitating its balanced growth (Janson et al., 2004) Such a framework should promote transparency, control risks faced by institutions engaged in microfinance, and eliminate any barriers and unnecessary requirements they face. Without an appropriate regulatory and supervisory framework, it is hard to see how these institutions can reasonably expect to continue their rapid growth while providing the safety and stability expected by depositors and the general public (Janson et al.,2004).

In the literature reviewed many scholars are for the removal of financial market imperfections that are deemed to be the major contributing factors to low growth and poverty especially in developing countries. Majority of scholarly works examining the role of financial systems in the economic development processes suggest that restrictive government policies and regulations in key markets coupled with gaps in the market regulation system reduce the affordability of services and products for firms along value chains and limit opportunities for market creation (IFC, 2019). Additionally, existing literature reveals that the strong interest in microfinance regulation has coincided with reform initiatives to the regulatory framework for microfinance in many countries. Consequently, there is an increasing interest in the design of regulatory framework that would be conducive to the

growth of the microfinance industry to the extent that microfinance today seems to find itself in the midst of a rush to regulate (CGAP, 2011).

Relatedly, the need to improve and strengthen the empirical basis for public policy decisions continues to attract increasing recognition as an essential condition for improving the quality of public management and policymaking. Consequently, the design of effective regulatory policy is now the focus of much interest among policymakers hence the active pursuit by many countries including Kenya, of regulatory reform programmes aimed at improving the operating environment for investment and, more generally, enhancing the quality of public governance processes (OECD, 2012).

With the emergence of the regulatory state Majone, (1994, 1997) as the dominant paradigm in public sector management, increasing attention has been given to the design and implementation of good regulation which contributes to the goals that are set for the regulatory system. Consequently, many programs including Regulatory Impact Assessment (RIA) have been introduced as methods of policy analyses which is intended to assist policymakers in the design, implementation and monitoring of improvements to regulatory systems, by assessing the likely consequences of proposed regulation and the actual consequences of existing regulations.

Microfinance has become an increasingly popular tool in the fight against poverty and the promotion of economic development in most countries (Barry & Tacneng, 2011). Microfinance institutions (MFIs) have provided approximately 175 million persons with access to financial services, which undoubtedly facilitates the financial integration of individuals who are excluded from the formal banking industry (Tchuigoua, 2014). This exponential growth of MFIs has led to increased regulatory calls. However, on one hand, some pundits have argued that as a consequence, compliance with prudential rules and the related supervisory guidelines can be particularly costly for most microfinance entities (Karimu et al., 2019). On the other hand, MFI regulation is becoming increasingly important, as MFIs including MFBs are able to mobilize deposits from the public especially from relatively poor households. Thus, the protection of such deposits is a relevant policy issue. In

addition, some scholars have argued that MFI regulation increases the cost of MFI lending (Muriu, 2011).

Globally, in an effort to protect depositors, many governments have introduced microfinance laws and regulations (Ndambu, 2011). In the European Union, the legal framework for MFIs in member states ranges from dedicated legislation for microfinance provision to specific provisions on micro lending. For example, in Romania and France, the legal framework contains specific rules relating to microcredit and nonbanking institutions. Italy has legislation for the creation of non-bank microfinance institutions, while Spain has no specific microfinance law (Kaloki & Muendo, 2018). In Bangladesh, the country's Microcredit Regulatory Authority established a formal regulatory framework in 2006. In Bolivia, Peru and other Latin American states MFI regulatory frameworks are basically formed by amendments of their banking laws (Khalily, Khaleque & Badruddoza, 2014).

Many countries in Africa have witnessed an exponential growth of microfinance institutions in the last two decades. It has been reported that, more than 100 million customers borrow micro loans from more than 10,000 MFIs across Africa (Carlson, 2018). Due to the growth, MFIs regulation gained momentum and elevated higher anticipations in the Sub-Saharan Africa (SSA) region (Ndambu, 2011). As such, as of 2008, 29 countries in SSA had created specialized MFI legislation, whereas fourteen had grouped MFIs with other banks and put them under the existing banking regulations, while three countries had no put in place MFI regulations (Ndambu, 2011). In Nigeria, for example, the Nigerian Central Bank introduced stricter regulations for microfinance to provide a broader range of allowable undertakings by MFIs. In Ethiopia, Ethiopian National Bank was tasked with the role of regulating the MFIs under the MFI supervision and licensing Act of 1996 (Khalily, Khaleque & Badruddoza, 2014).

Closer home, in the East African region, deposit-taking MFIs are supervised and licensed by respective Central Banks (Ndambu, 2011). In Rwanda, the Rwanda National Bank is tasked with the supervision and regulation of Microfinance entities. As such, in 2006, there were eight MFIs in Rwanda that were forcibly closed down due to gross mismanagement, failure to meet minimal prudential guidelines and loss of customer confidence (Carlson, 2018). In

Burundi, the Bank of the Republic of Burundi regulates and supervises microfinance institutions (Kaloki & Muendo, 2018). In Tanzania, the Bank of Tanzania is responsible for the external regulation of MFIs, which means that they have significant power over the steps these financial service providers are taking to protect the clients they serve (Carlson, 2018).

Kenya can be said to be one of the earliest African countries to realize the significance of microfinance as one of the vital tools for eradicating poverty (King'ori, Kioko & Shikumo, 2017). A number of interrelated constraints among them the structure, composition and development of the banking sector motivated the need for microfinance in Kenya. In addition, the poor banking sector governance, lack of enabling regulations to improve quality of banking, general macroeconomic conditions and conservativeness of Kenyan banking institutions inspired MFIs growth (Smith, 2015). Kenya's regulatory quality over the last decades exhibits a steady decline, falling from a percentile rank of 50.24 in 2010 to 35.58 in 2020 (Kaufmann, Kraay & Mastruzzi, 2010). This is manifested more broadly, in new rules and regulations being promulgated without sufficient grounding in evidence or consideration of alternatives to traditional command-and-control regulation. In 2013, the Statutory Instruments Act was enacted in an attempt to establish a systemic approach to regulatory quality. However, studies have alluded to a lack of a more complete institutional and procedural framework for regulatory impact assessments that severely hampers implementation of the said Act (IFC, 2019).

Although the Kenyan microfinance industry remains one of the most dynamic in sub-Saharan Africa, with good infrastructure and diversity of institutional forms to serve the society's poor, MFI activities remained unregulated until the enactment of Microfinance Act of 2006, and later the Microfinance (Deposit-taking institutions) Regulations of 2008 (Kaloki & Muendo, 2018). Thirteen years later and despite exponential growth of MFIs, the microfinance sector is considered to remain weak in comparison to its clientele size. Statistics show that most MFBs in Kenya have incurred losses since the licensing of the first institution in 2009 by the Central Bank. This, calls for continued study to examine the likely consequences of the existing law on the performance of microfinance institutions in Kenya

and in the context of the need to improve and strengthen the empirical basis for public policy decisions.

1.1.1 Microfinance Regulations

There is no generally agreed definition of regulation but it can be broadly understood to refer to a government measure which is intended to affect individual or group behavior (Kirkpatrick, 2006). Regulation entails a set of binding rules that govern or restricts the activities of market participants and, as a consequence, affects the results of such activities (Kilonzo, 2012). Regulation is an integral part of MFBs corporate governance and ensures that the procedures and processes for advancing credit are harmonious across institutions (Karimu et al., 2019). Microfinance sector regulation aims at averting MFB crises, protecting depositors, maintaining stable systems of payment and encourages efficacy and competition. It is argued that the ultimate beneficiaries of MFB regulations are the microfinance clients and the MFBs (Khalily, Khaleque & Badruddoza, 2014). In most countries, microfinance regulation usually falls under two categories that include non-prudential and prudential regulations (Siwale & Okoye, 2017).

Non-prudential regulation, also referred to as conduct of business regulation, does not entail the assessment and monitoring of the financial health of a regulated MFB by a regulatory authority (Tchuigoua, 2014). Non-prudential guidelines permits MFBs to develop within a framework of regulatory guidelines and requirements and to work sustainably with a high degree of efficacy (Khalily, Khaleque & Badruddoza, 2014). Non-prudential (conduct of business) regulatory issues, relevant to micro-finance, span a wide spectrum. These issues include enabling the formation and operation of micro lending institutions; protecting consumers; preventing fraud and financial crimes; setting up credit information services; supporting secured transactions; developing policies with respect to interest rates; setting limitations on foreign ownership, management, and sources of capital; identifying tax and accounting issues; plus a variety of cross-cutting issues surrounding transformations from one institutional type to another (Christen, Lyman & Rosenberg, 2003). Non- prudential regulations covers a variety of topics and therefore involves a variety of regulators for

example consumer protection agencies and financial intelligence units. Examples of non-prudential regulations include anti-money laundering and combating financing of terrorism laws.

Prudential regulation aims specifically at protecting the financial system as a whole as well as protecting the safety of small deposits in individual institutions. When a deposit-taking institution becomes insolvent, it cannot honor its payment obligations to depositors, and if it is a large institution, its failure could undermine public confidence such that the banking system may suffer a run-on deposit. Therefore, prudential regulation involves the government overseeing the financial soundness of the regulated institutions: such regulation aims at ensuring that licensed institutions remain solvent or stop collecting deposits if they become insolvent (Christen, Lyman & Rosenberg, 2003). In a nutshell, prudential regulation covers the broad principles or legal requirements designed to enhance the stability and efficiency of financial market and institutions (Ali, 2015; Cull, Demirguc-Kunt & Morduch, 2009). Prudential regulations include reporting rules, capital adequacy as well as liquidity requirements. Prudential regulations have two main aims: to prevent unwarranted risk-taking and providing assurance, which helps MFBs to build confidence among their customers through sound management of capital, revenue and robust system of internal controls (Haq, Hoque & Pathan, 2008). This study thus focused on particular prudential regulations such capital, liquidity and loan loss provisioning that deposit taking MFBs, like banks, are subjected to by the CBK.

Microfinance regulation aims at protecting depositors by ensuring safety as well as soundness of financial entities, monitoring MFIs that are perceived to be operating separately from the normal financial industry, and expediting accessibility to other sources of funding, such as deposits (Vogel & Schulz, 2012). Microfinance regulatory mechanisms include, among others, minimum capital requirements, licensing requirements, liquidity and reserve requirements, corrective actions and sanctions, deposit insurance and reporting requirements (Tchuigoua, 2014). Deposit-taking MFBs regulation is deemed appropriate because MFB depositors are small, widespread, largely uneducated and lack the capacity to oversight the management (Dilven, 2017).

In Kenya, Microfinance institutions are classified into credit only MFIs and Deposit taking MFI (microfinance banks). Credit only MFIs are the largest microfinance providers in Kenya. However, they remain unregulated even though the Microfinance Act of 2006 mandates the minister responsible for finance to issue guidelines to govern the credit only MFIs. DTMs are regulated by the CBK and the Microfinance (DTM) regulations (2008) sets out the supervisory, regulatory and legal framework for Microfinance Banks (Kaloki & Muendo, 2018). Through the Microfinance Act 2006 and Microfinance (MFB) Regulations of 2008, the CBK is supposed to build a vibrant, stable, efficient and solid microfinance-banking industry by regulating and monitoring the activities of microfinance banks (CBK, 2018).

The Central Bank (CBK) prudentially regulates deposit taking microfinance institutions so that sustainability can be achieved as MFBs will be allowed to widen their sources of funding to include mobilization of savings from the public at a cost that is relatively lower than the prevailing lending rates in the market and be run efficiently (Kaloki & Muendo, 2018). However, there are a number of prudential requirements like consumer protection, consolidated supervision, cyber risk, business continuity planning and management which the current Act and Regulations does not provide for (CBK, 2018). The Kenyan regulatory framework requires MFBs to adhere to stringent capital, liquidity, loans loss provisioning and financial reporting requirements (Ayele, 2015).

Capital requirements in Kenya mostly entails capital adequacy ratios which comprises of 10% core capital in proportion to the aggregate risk-adjusted assets plus off-balance sheet items, then 8% core capital in proportion to total deposit liabilities and 12% total capital in proportion to the total risk-adjusted assets plus off-balance sheet items (Ali, 2015). MFBs are thus required to maintain core capital to total risk weighted assets (TRWA) and total capital to TRWA ratios of 10% and 12% respectively. On liquidity requirements, the institutions are required to maintain a liquidity ratio of 20% at all times (Kaloki & Muendo, 2018). In addition, insider loans are limited to 2% of tier one capital and should be restricted on aggregate within an upper limit of 20% of the core capital (Apalia, 2017).

According to CBK, considerable changes have been experienced in the microfinance industry over the years and this has necessitated a review of the existing regulatory and supervisory framework for microfinance banks. CBK has drafted and exposed a draft Microfinance Bill for public and stakeholder review and comments and the Bill has now been presented to State Law Office for further action. Among other changes, the Bill expands the scope of the powers of CBK in setting the criteria for higher minimum capital ratios to include instances, where the Bank determines that the institution is systemically important or for any other reason as the CBK may determine based on its assessment of the institution's or group's risk profile. This study will focus on the deposit taking MFIs (microfinance banks) since they are the regulated MFIs in Kenya.

1.1.2 Microfinance Performance

Like other firms, MFBs have to measure their performance to evaluate their existence and growth. However, unlike other firms, MFI performance encompasses both finances (financial performance) and outreach (social performance) (Thrikawala, Locke & Reddy, 2013). Financial performance in financial institutions according to Stoner (2003) refers to profitability, ability to operate efficiently, survive, grow and react to the environmental opportunities and threats (Shkodra, 2019). It refers to the ability of an MFB to acquire and manage resources using different strategies to gain a competitive advantage (Barry & Tacneng, 2011). MFB financial performance is vital in order to achieve sustainable economic growth especially in emerging countries and incorporates the concepts of efficiency, sustainability and growth (Mbogo, Kirori & Satta, 2018).

MFBs financial performance is related to sustainability which is described as the ability of MFBs to be self-sufficient (Dilven, 2017). MFBs financial performance (self-sufficiency) is measured by the Operational Self Sufficiency (OSS) ratio, which measures how effectively an MFB covers its costs from its operating income (Rajdev & Bhatt, 2013). This metric is the extensively used proxy of MFBs financial performance due to institutional diversity and MFB accounting practices which makes it difficult to use the frequently used proxies like return on equity (ROE) and the return on assets (ROA) (Hartarska & Nadolnyak, 2007). The

performance and sustainability of MFBs is of greatest importance to the smooth development and functioning of an economy. MFBs performance is categorized into financial and social performance that in tandem leads to MFBs sustainability (Pati, 2015).

In recent years, there has been significant discussion concerning the introduction of social performance criteria for measuring MFI (including MFB) performance since traditionally the success of MFIs has often been measured using only financial measurements. The additional criteria have encouraged MFIs to improve their understanding of the simultaneous pursuit of financial and social performance, a double bottom line, in tradeoffs between economic and social return on investment. Social performance has been defined as the effective translation of an institution's social mission into practice in line with accepted social values such as serving larger numbers of poor and excluded people, improving the quality and appropriateness of financial services, creating benefits for clients, and improving social responsibility of an MFI (Thrikawala, Locke & Reddy, 2013).

Social performance is assessed in terms of outreach, which denotes the MFIs desire to affect their environment and fight against poverty in the areas where they operate (Dilven, 2017). MFIs social performance relates to the degree of outreach (Almas & Mukhtar, 2015). Outreach refers to the degree in which financial services are offered to the poor most in the society (Barry & Tacneng, 2011). Outreach shows that the target group is wider than customers to whom traditional banks also provide services. It is multidimensional and includes both breadth and depth of outreach. The outreach depth proxies how deep MFI financial services reach its poorest clients and is measured by the average loan balance (Amin et al., 2018). Outreach is also measured by the log of the number of active borrowers' i.e. the number of people who currently have a due loan balance with an MFI (Hartarska & Nadolnyak, 2007). In this study, MFIs performance was measured through the return on assets (ROA) ratio as the financial performance measure and outreach as the social performance measure.

1.2 Problem Statement

Appropriate regulation and supervision of microfinance is of critical importance in bringing the poor and vulnerable communities the financial services they need. However, pertinent concerns arise on how best to regulate and supervise this industry given its various specificities and broader social mission. Regulatory and supervisory initiative for microfinance must balance on the one hand the need for financial stability, resilience, integrity, and consumer protection with, on the other hand, inclusion, innovation and healthy competition (Christen, Lyman & Rosenberg, 2011).

Worldwide Governance Indicators, (Kaufmann, Kraay & Mastruzzi, 2010) suggests that Kenya has experienced a steady decline on regulatory quality over the last decade, falling from a percentile rank of 50.24 in 2010 to 35.58 in 2020. Pundits posit that there are challenges related to competition policy, and more broadly, to new rules and regulations being promulgated without sufficient grounding in evidence or consideration of alternatives to traditional command-and-control regulation (IFC, 2019). Consequently, there is a compelling requirement for studies and analyses to contribute towards the design, implementation and monitoring of improvements to regulatory systems, by providing a methodology for assessing the likely consequences of proposed regulation and the actual consequences of existing regulations (Vogel & Schulz, 2012).

Despite exponential growth of MFBs, some writers have found that the Kenyan microfinance sector remains weak in comparison to its clientele size (Apalia, 2017). Statistics show that the Kenyan microfinance sector is relatively stagnant and weak (Ali, 2015). As such, most MFBs in Kenya have incurred losses since the licensing of the first institution in 2009 by the CBK with the majority of the registered Microfinance banks documenting negative growth in profitability (Smith, 2015). Actually, between 2010 and 2016, out of the 13 licensed DTMs, only two managed to make profits (Kaloki & Muendo, 2018). Arguably, the Kenyan MFBs regulatory framework is considered as stringent and this study seeks to assess any possible effects of the existing regulatory and supervisory framework for MFB's on their financial and social performance.

In the circumstances, understanding how regulation impacts on the social and financial performance of MFBs is critical in monitoring and making improvements to regulatory systems.

1.3 Research Objectives

The main objective of this study was to determine the effect of prudential regulations on social and financial performance of microfinance banks in Kenya.

1.3.1 Specific Objectives

i. To examine the effect of capital regulations on social and financial performance of microfinance banks in Kenya
ii. To determine the effect of liquidity regulations on social and financial performance of microfinance banks in Kenya
iii. To establish the effect of loan loss provisioning requirements on social and financial performance of microfinance banks in Kenya

1.4 Research Questions

i. What is the effect of capital regulations on social and financial performance of microfinance banks in Kenya?
ii. What is the effect of liquidity regulations on social and financial performance of microfinance banks in Kenya?
iii. What is the effect of loan loss provisioning requirements on social and financial performance of microfinance banks in Kenya?

1.5 Significance of the Study

This study adds to the existing microfinance literature on regulation. It analyses the impact of regulation on MFBs social and financial performance in Kenya. In doing so, it distinguishes microfinance industry from the conventional banking industry given its various specificities and broader social mission. It highlights the need for innovation and rationality in regulatory

and supervisory initiative for microfinance to balance on the one hand the need for financial stability, resilience, integrity, and consumer protection with, on the other hand, inclusion, innovation and healthy competition.

Access to financial services-savings accounts, loans, money transfers, insurance services among others are still limited in developing countries. Scholarly literature on the role of financial systems in the economic development processes have identified restrictive government policies and regulations in key markets in addition to gaps in the market regulation systems as obstacles that reduce the affordability of services and products for firms along value chains limiting opportunities for market creation. Additionally, a growing body of literature shows a correlation between financial sector development, long-run economic growth, and poverty reduction. Microfinance is increasingly seen as an important instrument in the efforts by governments and international donor agencies to promote economic growth and alleviate poverty. Regulation is a major policy tool that governments can use to affect the outcomes of markets alongside fiscal policy. It has been documented that there is a strong interest in microfinance regulation which has coincided with the reform initiatives to the regulatory framework for microfinance in many countries. This provides a set of circumstances conducive for studies and analyses to contribute towards the design, implementation and monitoring of improvements to regulatory systems, by providing bases for assessing the likely consequences of proposed regulation and the actual consequences of existing regulations.

In view of the above, the findings of this study may be of significance to MFIs management, policymaking entities and to development finance literature. The study results will be useful to the management of microfinance institutions to make appropriate choices on how regulations affect their institutions performance as well reducing costs of compliance. The management of the microfinance institutions can use the study recommendations and conclusions to formulate appropriate policies to reduce the costs associated with regulatory compliance, noncompliance cost and enhance performance.

Further, the findings may be beneficial to policymaking bodies like the Central Bank of Kenya, Association of Microfinance Institutions (AMFI) and other policy formulators

concerning regulated and unregulated MFIs as they may apply the study conclusions and recommendations to develop strategic policies and design a regulatory framework that would be conducive to the growth of the microfinance industry.

Finally, this paper will supplement and complement the available empirical knowledge on microfinance regulation and performance both in Kenya and across the world. The study will also add on to the theoretical literature on the microfinance schism and the public interest theory of regulation. The paper may also be treated as part of a foundation for future research and further studies as the study will be making such suggestions after considering its own limitations.

1.6 Scope of the Study

This study aimed at assessing how prudential regulations affect social and financial performance of microfinance banks in Kenya. The research focused on capital regulations, liquidity regulations, loan loss provisioning requirements and their effect on social and financial performance of Kenyan microfinance banks. The study was carried among the 13 microfinance banks in Kenya. The study used unbalanced panel secondary data which was collected for seven years period from 2014 to 2020.

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CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

A large number of papers on microfinance regulation have been published since the early 1990s, mostly by donor agencies, international financial institutions such as the World Bank, and microfinance research centers. An example is CGAP‘s Guiding Principles on Regulation and Supervision of Microfinance, which were formally adopted by CGAP‘s 29 member donor agencies, and have become widely accepted industry standards (Christen, Lyman & Rosenberg, 2003). There are a few but growing numbers of articles in academic journals. The bulk of the literature can be said to be mostly descriptive in nature rather than analytic. Some of the publications include normative statements mainly based on theoretical considerations may be anecdotal evidence, and common-sense leaving room for rigorous empirical research. This chapter focuses on the theoretical literature review, which entails a review of various theoretical considerations which explain the concepts of microfinance regulations and performance. The chapter also reviews various studies, which have been carried out across the world on regulations and performance and presents the conceptual framework of the study and a summary of the reviewed literature.

2.2 Theoretical Review of Literature

This study was anchored on the public interest theory of regulation by Pigou (1938) and the microfinance schism by Murdoch (2000) as the key theoretical considerations guiding this study.

2.2.1 Public Interest Theory of Regulation

Pigou (1938) conceptualized the standard public interest or helping hand theory of regulation that is based on two assumptions. First, unhindered markets often fail because of the problems of monopoly or externalities. Second, governments are benign and are capable of

correcting these market failures through regulation. This theory has been used both as a prescription of what governments should do and as description of what they actually do. According to this theory, government controls process so that natural monopolies do not overcharge, impose safety standards to prevent accidents such as fires or mass poisonings, regulate jobs to counter the employer's monopsony power over employee, regulate security issuance so that investors are not cheated, and so on (Shleifer, 2005). It can be argued that the public interest theory has become the cornerstone of modern public economics and has been used to justify the growth in regulation.

The theory proposes that government regulation is a response to public calls for the state to rectify a situation of market failure due to market imbalances, imperfect competition, missing markets or socially undesirable market outcomes (Carlson, 2018). The theory states that regulation works as a policy tool to avert market failures mainly due to information asymmetries, market power or negative externalities like bank runs (Dilven, 2017). The theory explains that the goals of regulation is to protect and benefit the public as a whole. Regulation is therefore an attempt by the government to limit the scope of private activity (Christensen, 2010).

According to the public interest theory, the standard justification of state involvement in the financial sector arises due to market failure fears, since failure of a financial institution would produce a suboptimal result, which will affect the entire sector (Den-Hertog, 2010). A number of causes of market failure in the financial sector include asymmetric or insufficient information, externalities of financial disruption and moral hazard (Wood & Clement, 2015). This theory postulates that, financial sector regulation exists exclusively for the benefit of investors and depositors.

The public interest theory asserts that government intervention in financial intermediaries' governance is important and that every country with a banking sector has banking sector regulations (Hartarska & Nadolnyak, 2007). The theory expounds that MFIs regulation is like a public good aimed at protecting its clients. This is because private MFIs are hesitant to self-regulate leading to opportunistic behaviors by the entities (Khalily, Khaleque & Badruddoza, 2014). Thus, regulations are intended to keep the financial sector functional and healthy. The

government therefore walks the thin line between over regulation with potential harms to the MFBs and under regulation with potential harms to the consumer (Smith, 2015).

In relation to this study, the theory asserts that various factors support the need for regulation in the microfinance-banking sector. First, the microfinance market in the past has experienced significant failures. Further, microfinance includes consumer banking, an area that has long been described as suitable for government oversight (Khalily, Khaleque & Badruddoza, 2014). In addition, as an innovative activity, which has been credited for economic empowerment as well as poverty reduction, the sector, has been blamed for ruinous and exploitative lending practices, hence it is argued that it would be very risky to leave the sector unregulated. Lastly, microfinance is, after all, a sector where insufficient education and economic pressures affect the ability of individual participants to know, promote and protect their interests hence the call for regulation (Bernstein, 2013).

The Public Interest theory has its critics who lean towards the public choice theory, which is more skeptical about state intervention and motives and considers regulation to be socially ineffective (Mizutani & Nakamura, 2015). The public choice theory and analogous theories attempt to apply the tools of general economic theory to the political decision-making process. By analyzing the goals and incentives of different individual and groups and the problems posed in organizing groups, these theories give new and worthwhile insights into the workings and outcomes of political processes such as laws and regulations (Teutemann, 1990).

Some critics of the public interest theory have argued that markets and private orderings can take care of most market failures without any government intervention. They have also argued that in few cases where market might not work perfectly, private arrangements can address the conflicts market participants might have. Finally, the critics have argued that even if markets and other arrangements cannot solve all the problems perfectly, government regulators are incompetent, corrupt, and captured hence regulation would make things worse (Shleifer, 2005).

2.2.2 The Microfinance Schism

Murdoch's microfinance schism encompasses the win-win proposition by leading advocates for microfinance who argue that institutions guided by the principles of good banking will be the same that alleviate poverty the most. However, his exposition is caveated as a general proposition not fully founded on logic or available empirical evidence. Thus, he urges for full awareness of its limitations as an important step toward reaching a more constructive dialogue between microfinance advocates for financial development and those for social impacts; the welfarist's approach & the institutionalists' approach (Almas & Mukhtar, 2015; Barry & Tacneng, 2011).

As per the theory, eschewing subsidies and achieving financial sustainability enables microfinance institutions to grow without the limitations imposed by donor budgets. In the process, it is contended that these institutions acquire capability to serve more poor people than can be served by programs fueled by subsidies. A key tenet is that poor households demand access to credit, not cheap credit. Thus, programs can charge high interest rates without compromising outreach. In addition, Murdoch expounds that the win-win proposition rests on a series of supporting arguments leveraged on eight principal claims. First, that raising the costs of financial services does not diminish demand for loans. The point here is that some poor households are able to pay high rates. However, the concern is that there are also many borrowers who cannot pay high rates. These latter households constitute a large fraction of client bases and they tend to be poorer and harder to reach with traditional programs. If these programs raised interest rates, they might not suffer for lack of demand but their programs risk losing much of their current client base, including the particularly vulnerable and underserved segments of poor populations that appear to be served well by moderately-subsidized microfinance programs versus other economic development initiatives (Barry & Tacneng, 2011).

Second, that due to their scale, financially sustainable programs can make the greatest dent in poverty. This argument speaks more to the tradeoffs in scale and outreach when the objective is to minimize poverty, a measure that is sensitive to the distribution of incomes below the poverty line. Third, that financial sustainability will give programs access to commercial

financial markets. The point here is that financial sustainability is critical for institutions as it is the route to being able to access capital from commercial financial markets rather than donors. Fourth, that since they come at no cost to donors, financially sustainable programs are superior weapons for fighting poverty. The argument here is that since sustainable programs do not require outside funding, consideration of costs and benefits is irrelevant. There are no costs borne by governments or aid agencies there are only benefits. Sustainable programs are thus superior to subsidized programs. Fifth, that subsidized programs are inefficient and thus bound to fail. It is asserted that microenterprise financial intermediaries have learned that they cannot depend on governments and donors as reliable, long-term sources of subsidized funding.

Relatedly, the sixth claim is that subsidized credit most often ends up in the hands of the nonpoor. A common experience in the credit programs implemented in the 1960s and 1970s and perhaps still alive is that subsidized credit may often be diverted away from poor households. Since the subsidies are valuable, politically powerful groups, usually not poor, do muscle their way in and manage to grab a share. The problem can be compounded by the fact that most programs are government-run, providing further incentives for misfeasance as the granting of loans may be deployed as a political payoff. Seventh, that successful microfinance programs must be nongovernment programs and, eighth, that subsidizing credit undermines savings mobilization. The assertion here being that mobilizing savings is not likely to make sense for subsidized credit programs with lessons from the recent microfinance experience, being that even poor households are eager to save if given appealing interest rates and/or flexible accounts

Murdoch further asserts, and rightly so in my view that not all of those who believe in the importance of financial sustainability will accept each claim. However, the claims are often heard together, and they form a core set of ideas. Each is rooted in the experience of some programs in some places and at some times. As general propositions however, they each rest on problematic logical extrapolations, inappropriate assumptions, or misreading of evidence. Therefore, the various concerns that arise from the proponents of MFI financial self-sufficiency versus the proponents of MFIs depth of outreach (Prakash & Malhotra, 2017) are

still alive. The contention is that MFIs are nowadays focusing mainly on profitability at the expense of helping the poor and reducing poverty incidences leading to MFIs mission drift (Rocha, Zepeda & Ponce, 2019).

The Welfarist approach emphasizes on helping the poor without attaining financial self-sufficiency. They argue that aid (donations) can serve as capital and that donors can be seen as social investors who, unlike equity providers seek social returns and not dividends. Welfarists lay more importance to poverty alleviation, women empowerment, depth of outreach and measure success in terms of social variables (Prakash & Malhotra, 2017). Thus, Welfarists insist that outreach, mitigation of non-material and material poverty are important tools for sustainable development through the provision of non-financial and financial services, although some of these services may need subsidies. According to this approach, microcredit is provided to poorest people with the help of donor's funds (Rajdev & Bhatt, 2013).

The institutional approach advocates that an MFI (and in this case MFBs) should be capable of covering its financing and operating costs and should rely less on grants and subsidies (Prakash & Malhotra, 2017). Therefore, confronting the schism between rhetoric and action and between financially minded donors and socially-minded programs demands that both donors and practitioners pay greater attention to who is being served.

One of the claims underpinning the microfinance schism theory is the minimal role of government. It is claimed that microfinance has been and should continue to be a movement with minimal government involvement. The argument is that governments in low-income countries have played very little direct role in the microfinance movement because it has been fundamentally an NGO movement, free of many of the political biases of earlier subsidized programs. The problem presented by this is acknowledged, as there are good and bad NGOs and often little apparatus for effective oversight, but then Murdoch argues that so far, the microfinance record of accomplishment has allayed most fears. He also admits that governments have played critical indirect roles in Thailand, Bangladesh and China as examples.

On this point, he concludes that while sustainable programs can afford to eschew government involvement, subsidized programs cannot. His explanation is that subsidized programs need NGOs, foundations, international donors, or their own governments for funding. He states that if subsidized programs are to continue at current funding levels, they will likely need to rely increasingly on their own governments. Drawing lessons from past failures, it is argued there is need for a clear understanding of the (sharp) limits to direct government involvement and a commitment to the transparency and accountability of programs.

In this study, this theory argues that the involvement of regulators can lead to mission shift (microfinance schism) mostly when regulatory compliance requirements divert attention from serving the poor to lending to wealthier clients in order to meet financial performance requirements. In addition, the theory supports that regulation can hold back inventions in lending technologies which advances MFIs' ability to serve poor customers and to expand outreach. In view of the foregoing, the study adopted this theory to examine the selected elements of MFB regulatory framework and their effects on the social and financial performance of the MFBs.

2.3 Empirical Review

In the last few years, the field of microfinance has changed substantially and the landscape for financial services for the poor has been influenced by many events (Ledgerwood & Gibson, 2013). Three significant big picture influences are highlighted. Firstly, there has been a shift from a narrow focus on the institution and its performance to a much broader focus on clients, understanding their behavior, financial service needs, and how various providers can better meet these needs. The shift has been brought on by the recognition supported by significantly better data and more robust research that outreach and, perhaps more important, impact have not been as expected. Furthermore, the view of microfinance has widened and is no longer limited to investing in microenterprises. Microfinance now encompasses all financial services and how to provide them in a way that improves the quality of life of poor women and men (Ledgerwood & Gibson, 2013).

Second, is the shift from narrow supply-led view to a broader focus on the financial ecosystem. In addition to a renewed focus on consumers (demand), proponents of the "systems" approach acknowledge the variety of providers and services, including the substantial role of the informal sector. They also acknowledge the need for effective rules that govern the system and supporting functions such as credit bureaus or payment systems. The result has been a much more holistic view of the sector and a more coordinated effort by government and industry to focus on increasing financial inclusion and, ultimately, making markets work better for the poor.

Third, is the vast opportunity to expand outreach through new business models based on branchless banking using technology and agent networks. Admittedly, while the opportunity seems vast, to date only a few branchless banking applications have reached significant scale. A lot more work and testing to understand and determine ways to take advantage of the opportunities that technology presents.

Nevertheless, microfinance is seen as an integral part of an inclusive financial system. As a result, financial inclusion has become an important policy goal that complements the traditional pillars of monetary and financial stability, as well as other regulatory objectives such as consumer protection (Hannig & Jansen 2010). Thus, the literature reviewed outline the role of government (through its policies, regulation, and other support for a stable financial sector) and industry (through standards and guidelines) in promoting financial inclusion, as both separate and sometimes overlapping arenas of activity. Furthermore, the coordination and advocacy are recognized as important functions within the market system.

Different countries have put in place diverse microfinance regulations and the microfinance sectors in different countries are not similar. The microfinance sector is also supervised and regulated under different laws in different countries. As such, several studies have explored financial institutions regulations and performance in various countries both in the developed and developing countries. In the final analysis, regulatory objectives for microfinance can be summarized as comprising of five public interest objectives being promotion of safety and soundness of MFIs; guarding against systemic risk, establishing a competitive market; consumer protections and improving access to financial services (Staschen, 2010).

2.3.1 Capital Regulations and Performance

Capital adequacy requirements set standards for MFBs by prescribing their ability to pay liabilities, and respond to credit risks and operational risks (Assefa, 2020). Capital adequacy requirements could be in the form of capital adequacy ratio (CAR) or minimum amount of capital to be maintained by an MFB. An MFB with a good CAR has enough capital to absorb potential losses and less risk of becoming insolvent and losing depositor's money. The conventional view on regulatory impacts is that high capital requirements will positively influence the MFI sector performance (Pasiouras, Tanna & Zopounidis, 2009). Strict capital requirements are linked with reduced bad loans. However, it can be argued that strict capital requirements are robustly related to the stability, development or performance of the microfinance-banking sector. Inadequate capital escalates microfinance bank failure risks, while too much capital may result in excessive costs to microfinance banking entities, which adversely affects the microfinance banking system efficiency (Chortareas, Girardone & Ventouri, 2012).

Several studies have explored the link between capital requirements and performance of various financial institutions. In Europe, Bouheni et al (2014) studied the effects of regulatory and supervisory polices on profitability and risk taking for European banks over the period 2005 to 2011. The study applied the Generalized Method of Moments (GMM) and the findings revealed that strengthening capital guidelines and supervision increases banking entities profitability as well as enhancing their stability. The study further found that the bank's profitability was positively affected by deposit insurance schemes and capital adequacy. Similarly, Abbas, Iqbal and Aziz (2019) examined the effect of bank capital on banks profitability and documented that bank capital has a positive impact on profitability in large and medium banks.

A cross-country study by Pasiouras, Tanna and Zopounidis (2009) using a stochastic frontier analysis explored how the supervision and regulatory framework influences bank's efficiency. The study collected data from 615 banking entities in 74 states between 2000 and 2004. The study findings documented that regulations and incentives that enhance market discipline, and higher supervisory power of the authorities increase both cost and profit

efficiency while stricter capital requirements have a positive impact on cost efficiency but a negative impact on profit efficiency. However, a study by Gudmundsson et al. (2013) in Kenya examined the role of capital requirements on bank competition and stability using fixed effects panel regression and documented a positive relationship between capital regulation and the performance and financial stability of banks.

Additionally, Chortareas et al (2012) assessed the link between supervisory and regulatory guidelines on bank efficiency and performance. The study collected data from 22 EU countries between 2000 and 2008 with generalized and truncated regressions models being used for analysis. The study found that strengthening supervisory powers and capital requirements efficiently improved bank's operations. The study further found that interventionist regulatory and supervisory guidelines like bank activities restriction and monitoring of the private sector might lead to greater inefficiency levels in the banking sector. However, in their study on the effect of capital adequacy on performance of SACCOS in Kenya, Barus et al. (2017) found a positive interrelationship between capital adequacy and financial performance.

Among Latin American countries, Amin et al (2018) explored the effect of MFIs regulation on their profitability and outreach. Data was collected from 413 MFIs in 21 Latin American Countries between 2005 and 2017. Using the GMM method for analysis, the study documented MFIs that are regulated are much interested in offering services to better-off customers who reduce their borrowing costs and increase their financial performance. The study found that MFIs that were not regulated majorly served poor clients since they had low regulatory compliance costs. In addition, any increase in capital-based requirements was compensated by serving better-off clients.

In Kenya, Kaloki and Muendo (2018) examined the effect of CBK regulations on Microfinance banks' financial performance. A descriptive design was used and collection of data was through questionnaires from the 13 MFBs in 2016. Using the regression model for analysis, the study found that Kenyan microfinance banks financial performance were largely affected by capital adequacy requirements, statutory requirements, operational requirements and financial reporting requirements. The study revealed that core capital/total risk weighted

assets (TRWA) of 10% and total capital/total risk weighted assets ratio of 12% are high and the capital requirement of Ksh 60 Million and Ksh. 20 Million for nationwide and community MFBs were high and moderate respectively. The study concluded that capital adequacy requirements greatly affected MFBs financial performance. Even though this study focused on microfinance banks in Kenya, the study only focused on capital requirements and did not capture the effect of liquidity and LLP provisioning.

2.3.2 Liquidity Regulations and Performance

Liquidity requirements prescribe that financial entities are to hold a specified amount of cash in the event of financial emergencies. Due to the need for liquidity, financial entities must hold sufficiently high-quality liquid assets against anticipated net cash outflows for 30 days to support short-term resilience (Duijm & Wierts, 2016). Liquidity requirements are normally assessed through the liquidity coverage ratio (LCR) which refers to the ratio where the numerator represents the amount of high-quality cash, that is, assets which can be immediately and easily converted to cash with little or no impairment (Bonner & Eijffinger, 2016). Any MFB facing liquidity problems has a strong incentive for long-term interbank financing and is more willing to borrow from the central bank to meet liquidity deficiencies.

In their study, Mutarindwa, Schäfer and Stephan (2020) examined the effect of liquidity requirements on African banks stability and lending. The study measured the liquidity requirements through the net stable financing ratio. The study documented that banks observing various liquidity thresholds lends smaller amounts compared with their peers while banks observing capital thresholds lend more than less capitalized banking entities. The study concluded that the possibility of regulatory compliance among African banks strongly depends on the strength of the home country's regulatory institutions. Adusei (2021) on his study on liquidity-financial performance nexus among MFIs however documented a negative and statistically significant relationship between liquidity requirement and MFIs performance.

Using a panel of 1490 microfinance institutions from 111 countries between 2003 and 2011, Dilven (2017) examined how regulations affected MFIs social and financial performance.

The study revealed that regulation had an adverse influence on MFIs social performance but MFIs regulatory impact on MFIs financial performance resulted to mixed results due to lower costs per dollar advanced as credit and lower interest rates. The study also found that under regulatory conditions, non-profit-based MFIs had higher financial and social performance compared to profit-based MFIs. This finding was also supported by Mashamba (2018) who found a positive interrelationship between liquidity regulations and bank profitability in Zimbabwe using the GMM estimation technique.

In Kenya, Wanjiru (2016) examined the effects of regulation on Kenya's MFBs financial performance. A descriptive design was adopted and data was gathered from the Kenyan MFBs between 2011 and 2015. Using the regression model for data analysis, the results documented that liquidity negatively affected ROA while asset quality had a negative effect on ROA. Further, it was documented that capital adequacy negatively affected ROE whereas liquidity negatively affected ROE and asset quality positively affected the microfinance banks ROE. However, in the study on, liquidity regulation and Kenyan banks financial performance, Kiptoo and Maniagi (2020) found that liquidity regulations positively affected Kenyan banks financial performance.

In another study, Bonner and Eijffinger (2016) examined how liquidity regulation affected Dutch banks financial intermediation. The study analyzed how non-compliance with the LCR ratio affected banks intermediation through regression analysis. The findings revealed that liquidity requirements non-compliance requires banks to charge high lending rates, increase borrowing and reduce lending in the long-term interbank market. The study also found that banking entities with liquidity deficiencies mostly use long-term interbank lending rate to advance loans to nonfinancial institutions. However, Banerjee and Mio (2018) examined the impact of liquidity regulation on banks in the UK documented that tightening of liquidity regulation had no impact on the bank overall financial performance.

2.3.3 Loan Loss Provisioning and Performance

Loan Loss Provisioning (LLP) is a policy pursued by MFIs by allocating some money (reserves) to offset potential credit defaults, which sequentially aids in protecting MFI

positions in terms of capital and profitability (Alhadab & Alsahawneh, 2016). The more banking entities are exposed to riskier loans, the more outstanding loans accumulate and reduce profitability. This suggests that the reduction in loan loss provisions is in many cases the main catalyst for increasing profit margins (Magomere & Otinga, 2019). Alhadab and Alsahawneh (2016) have examined how loan loss provisioning affects Jordanian banks profitability. Data was collected from 13 listed banks between 2004 and 2014. Through regression analysis, the study found that the bank's profitability was negatively affected by increase in loan loss provisions. However, Zulfikar and Sri (2019) in their study on loan loss provision of sharia financing and financial performance documented that loan loss provisions had a positive effect on financial performance.

In their study, Magomere and Otinga (2019) examined whether LLP, operating cost and capital adequacy affected MFIs financial performance in Kakamega County. The study adopted a descriptive survey and used questionnaires to collect data from 122 senior management staff from 17 of MFIs located in Kakamega County. Data was analysed using the regression model. The study concluded that capital adequacy significantly influences Micro Financial Institutions return on investment in Kakamega County thereby indicating that capital adequacy issues such as, adequate capital base, relative capital and minimum capital requirements have a significant bearing on MFI's return on investment. The study recommends that MFIs should enact effective costs saving measures that can affect positively on MFIs return on investment to maintain a competitive edge. Further, the study recommended that MFIs engage in viable loan loss provisioning such as long-term debt financing, provisioning for bad debts, a priori loan loss reserve and appropriate provision expenses to realize an increase in return on investment.

In India, Purkayastha, Tripathy and Das (2018) examined whether regulation and competition influences MFIs performance. The study collected data from 60 MFIs in India between 2008 and 2013. The study used panel data estimation techniques to assess the interrelationships. The study reveals that competition strengthens the outreach, promotes operating efficiency, deteriorates the loan portfolio quality and adversely affects the MFIs profitability. While the regulatory intervention creates some accommodative space for the

MFI borrowers, improves MFIs efficiency partially and dampens loan repayments and portfolio quality and profitability. Muriu and Kiplangat (2020) in their study on what explains provisioning behaviour in the banking industry in Kenya and documented that that banks use loan loss provisions for capital management which is more pronounced among small banks.

In Pakistan, Ahmad, Tahir and Aziz (2014) examined whether LLP affects Pakistan banks performance and stability. The study collected panel data from 13 banks between 2009 and 2012. Through regression analysis, the findings revealed that loan loss provision was a significant factor that affected banks profitability. The study concluded that ideally, a well-established banking entity should have fewer provisions for loan losses leading to higher profitability, and deposits and advances as well play a crucial role in the bank's stability and profitability. Similarly, Mustafa, Ansari and Younis (2012) in their study on impact of loan loss provisions on Pakistan banks performance documented that a lower loan loss provision translated into higher profitability.

M'Mukiri (2013) examined the effect of the government regulation on Kenyan MFBs financial sustainability. The study using questionnaires collected data from 30 retail MFIs and a multivariate regression model used for analyzing data. The study found that loan provisioning had a negative influence on MFIs financial sustainability. Further, the author documented that liquidity and capital adequacy requirements positively affected Kenyan MFIs financial sustainability.

2.4 Summary of Literature and Research Gaps

A number of studies reviewed among them Bouheni et al (2014) among European banks and Pasiouras et al (2009) in 74 countries have documented a positive link between CAR and profitability. However, the context of these studies were banks and not MFBs. Chortareas et al (2012) also documented that strengthening capital restrictions improved banks efficiency but the study focused on banking entities too. Mutarindwa et al (2020) looked at African banks and documented that banks observing liquidity thresholds lend less compared to their peers. Again, the study focused on the banking sector and not MFBs. Alhadab and

Alsahawneh (2016) in Jordan and Ahmad, Tahir and Aziz (2014) in Pakistan, found that loan loss provision significantly affected bank profitability with the studies focusing on banks, not MFBs.

Further, in the banking sector, Abbas, Iqbal and Aziz (2019) documented that bank capital has a positive impact on profitability in large and medium banks while Mashamba (2018) found a positive interrelationship between liquidity regulations and bank profitability in Zimbabwe using the GMM estimation technique. However, Banerjee and Mio (2018) in the UK documented that tightening of liquidity regulation had no impact on the bank overall financial performance. Zulfikar and Sri (2019) in their study documented that loan loss provisions had a positive effect on financial performance but the context of the study was Islamic banks.

With respect to MFBs, Amin et al (2018) has looked at 21 Latin American Countries but only compares financial performance of regulated and unregulated MFIs and does not examine social performance. Dilven (2017) uses a panel of 1490 microfinance institutions from 111 different countries over the period of 2003-2011 to address what effect competition, profit orientation, and regulation have on the social and financial performance of microfinance institutions. However, his study was cross-country in nature hence the findings may not be generalized to a single country.

In India Purkayastha et al (2018) examines the effect of competition and regulation on Microfinance Institutions (MFIs) outcomes. He uses data for 60 MFIs from the MIX Market database for a period of five years from 2008-09 to 2012-13 but the study is country specific and focused on financial performance leaving out social performance.

In Kenya, Kaloki and Muendo (2018) documented that CBK regulations affected MFB banks performance but the study used both primary and secondary data with primary data being collected through questionnaire. In addition, the study is also focused on financial performance only leaving out social performance. Magomere and Otinga (2019) examines whether LLP, operating cost and capital adequacy affected MFIs financial performance in Kakamega County. The study adopted a descriptive survey and used questionnaires to collect

data from 122 senior management staff from 17 of MFIs located in Kakamega County. The study is county specific as it focuses on Kakamega County. It is also focused on financial performance leaving out social performance. Kiptoo and Maniagi (2020) also documented that liquidity regulations positively affected Kenyan banks financial performance but the study's context was commercial banks.

In their study, Gudmundsson et al. (2013) in Kenya documented a positive relationship between capital regulations and the performance and financial stability of banks but the study focused on commercial banks. Barus et al. (2017) also found a positive interrelationship between capital adequacy and financial performance but the study was undertaken among SACCOs. M'Mukiri (2013) also examined the effect of the government regulation on Kenyan MFBs financial sustainability. Using questionnaires collected data from 30 retail MFIs and a multivariate regression model used for data analysis, the study finds that loan provisioning had a negative influence on MFIs financial sustainability. However, the study is also focused on financial performance leaving out social performance. Furthermore, the study is in the context of MFIs that broadly include MFBs among other players in microfinance.

From the reviewed studies, it is apparent that most of the studies focus more on the banking sector as opposed to the MFI sector hence contextual gaps. In addition, most studies focused on MFIs have concentrated on financial performance leaving out social performance. Furthermore, times have changed and developments in the financial sector have led to enhanced enforcement as compared to the period covered in the studies reviewed. The studies in Kenya have used primary data collected through questionnaires hence methodological gaps. Table 2.1 below summarizes the studies and the knowledge gaps thereon.

Table 2. 1 Summary of Studies and Knowledge Gaps

Author (Focus)	Findings	Study Gaps	Study Focus
Bouheni et al (2014), Effects of regulatory and supervisory polices on profitability and risk taking for European banks	Strengthening capital guidelines and supervision increases banking entities profitability as well as enhancing their stability. Bank's profitability was positively affected by deposit insurance schemes and capital adequacy	Contextual Gap as study is conducted among banks in a developed economy (Europe)	Study is premised among the MFBs that are in a developing country context
Pasiouras, Tanna and Zopounidis (2009) explored how the supervision and regulatory framework influences bank's efficiency	Regulations and incentives that enhance market discipline, and higher supervisory power of the authorities increase both cost and profit efficiency while stricter capital requirements have a positive impact on cost efficiency but a negative impact on profit efficiency.	Contextual Gap as study is conducted among banks in cross countries of developed economies	Study is premised among the MFBs that are in a developing country context
Chortareas et al (2012) assessed the link between supervisory and regulatory guidelines on bank efficiency and performance	Strengthening supervisory powers and capital requirements efficiently improved bank's operations. Interventionist regulatory and supervisory guidelines like bank activities restriction and monitoring of the private sector might lead to greater inefficiency levels in the banking sector.	Contextual Gap as study is conducted among banks in developed economies (EU)	Study is premised among the MFBs that are in a developing country context
Amin et al (2018) effect of MFIs regulation on their profitability and outreach	MFIs that are regulated are much interested in offering services to better-off customers who reduce their borrowing costs and increase their financial performance. The study found that MFIs that were not regulated majorly served poor clients since they had low regulatory compliance costs.	Contextual Gap as study is conducted among MFIs in Latin American economies (EU)	Study is premised among the MFBs that are in a developing country context
Kaloki and Muendo (2018) examined the	Microfinance banks financial performance were largely affected by capital adequacy requirements,	The study only focused on capital requirements and did not	Study incorporates LLP

effect of CBK regulations on Microfinance banks' financial performance	statutory requirements, operational requirements and financial reporting requirements.	capture the effect of liquidity and LLP provisioning.	provisioning as a determinant of performance.
Dilven (2017) examined how regulations affected MFIs social and financial performance	Regulation had an adverse influence on MFIs social performance but MFIs regulatory impact on MFIs financial performance resulted to mixed results due to lower costs per dollar advanced as credit and lower interest rates. Under regulatory conditions, nonprofit-based MFIs had higher financial and social performance compared to profit based MFIs.	Contextual Gap as study is conducted among banks in cross countries of developed economies	Study is premised among the MFBs that are in a developing country context
Wanjiru (2016) examined the effects of regulation on Kenya's MFBs financial performance	Liquidity negatively affected ROA while asset quality had a negative effect on ROA. Capital adequacy negatively affected ROE whereas liquidity negatively affected ROE and asset quality positively affected the microfinance banks ROE.	Findings diverge from findings by Kiptoo and Maniagi (2020) that liquidity regulations positively affected Kenyan banks financial performance.	Study is premised among the MFBs to authenticate the contradictory findings
Bonner and Eijffinger (2016) examined how liquidity regulation affected Dutch banks financial intermediation.	Liquidity requirements non-compliance requires banks to charge high lending rates, increase borrowing and reduce lending in the long-term interbank market. Banking entities with liquidity deficiencies mostly use long-term interbank lending rate to advance loans to nonfinancial institutions.	Findings diverge from findings of Banerjee and Mio (2018) that regulation on banks in the UK which documented that tightening of liquidity regulation had no impact on the bank overall financial performance.	Study is premised among the MFBs that are in a developing country context to authenticate the contradictory findings
Magomere and Otinga (2019) examined whether LLP, operating cost and capital adequacy affected MFIs financial performance in	Capital adequacy significantly influences Micro Financial Institutions return on investment in Kakamega County thereby indicating that capital adequacy issues such as, adequate capital base, relative capital and minimum capital requirements have a significant bearing on MFI's return on investment.	Recommends that MFIs should enact effective costs saving measures that can affect positively on MFIs return on investment to maintain a competitive edge.	Study is premised among the MFIs to authenticate the recommendations

Kakamega County M'Mukiri (2013) examined the effect of the government regulation on Kenyan MFBs financial sustainability	Loan provisioning had a negative influence on MFIs financial sustainability. Liquidity and capital adequacy requirements positively affected Kenyan MFIs financial sustainability.	There has been a time lapse and hence the need to replicate the studies.	Study is premised among the MFBs to authenticate the recommendations

2.5 Conceptual Framework

A conceptual framework was developed to show the interrelationship between microfinance regulations indicators and performance. From the reviewed literature, several studies have documented that capital, liquidity and loan loss provisioning regulations as the major prudential regulations in the Kenyan microfinance sector. Thus, this study focused on capital, liquidity and loan loss provisioning regulations as the independent variables while performance was the dependent variable size and age were the control variables. Figure 2.1 shows the conceptual framework.

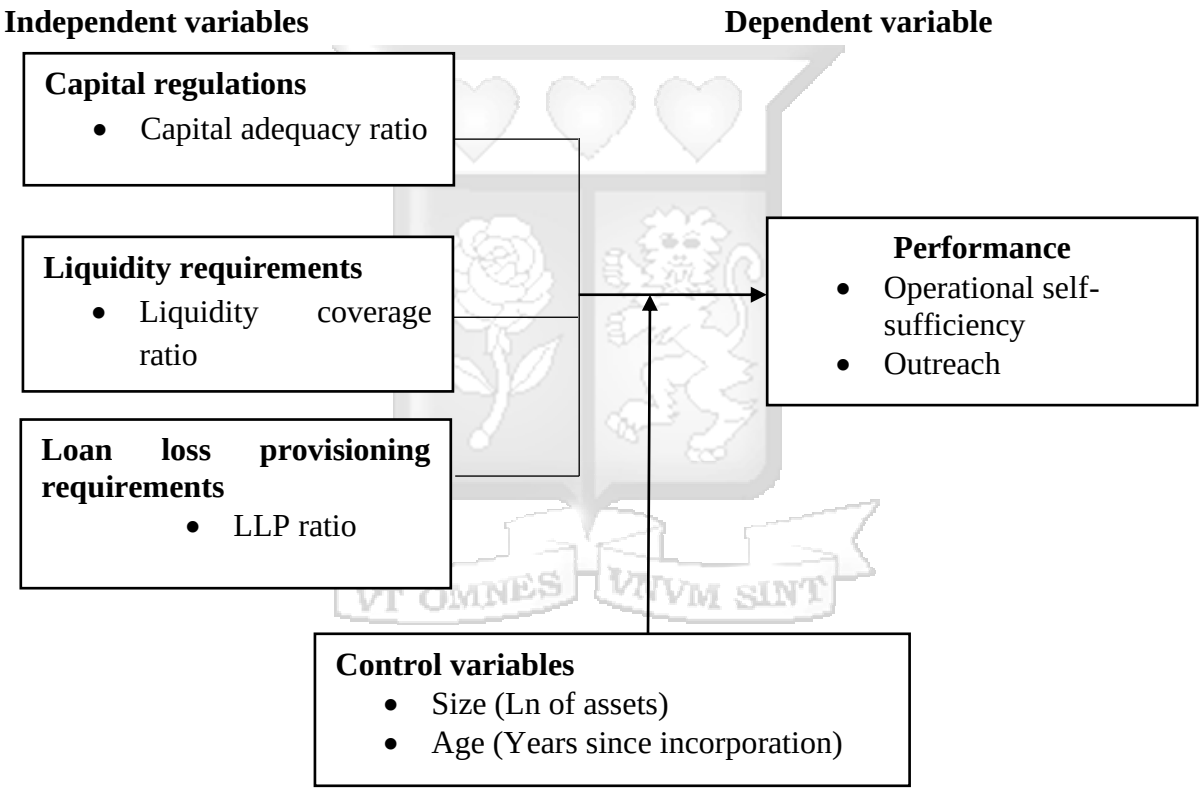

Figure 2. 1 Conceptual Framework

Source: Researcher (2022)

2.6 Operationalization of Variables

This study focused on capital regulations, liquidity requirements and loan loss provisioning requirements as the key microfinance regulations. In regard of capital regulatory

requirements, literature advances two arguments. Capital adequacy on one hand is viewed as an instrument limiting excessive risk taking of bank owners with limited liability and, thus, promoting optimal risk sharing between bank owners and depositors. Moreover, capital adequacy regulation is often viewed as a buffer against insolvency crises, limiting the costs of financial distress by reducing the probability of insolvency of banks (Gudmundsson et al., 2013). Thus, with risk reduction it is assumed that higher capital requirements positively impact performance of financial entities. In addition, the restrictions on capital adequacy ratios affect the banks' risky investment strategies, as leverage and market share are positively related (Rahman, Chowdhury & Dey, 2018). Thus, this study postulates a positive interrelationship between capital regulatory requirements and MFBs performance

The amount of liquidity maintained by a bank (in terms of liquid assets holdings) may influence its profitability since liquid securities earn low returns. Therefore, banks with a high level of liquid assets holdings are predicted to be less profitable (Dilven, 2017). The free cash flow hypothesis explain that high liquidity provides more opportunities for managers to indulge in more self-aggrandizement by engaging in low-benefit projects and other tendencies that ultimately leads to poor financial performance (Adusei, 2021). Excessive liquidity also sacrifices the net interest income, while low liquidity breed liquidity risk (Mashamba, 2018). Based on these interconnections, the study predicts that a negative relationship exists between liquidity requirement and MFBs social and financial performance.

Loan loss provisions are usually associated with bank management policies in anticipating investment loss risks and improving financial performance (Zulfikar & Sri, 2019). Loan-loss reserves result in direct charges against earnings during upturns in the economic cycle, as banks anticipate future losses on the loan portfolio when the economy hits a downturn (Mustafa, Ansari & Younis, 2012). The bank assumes that a certain percentage of the loan will fail or become slow to pay. This method guarantees the solvency and capitalization of the bank if and when a failure occurs. The level of loan loss provisions is an indication of a bank's asset quality and signals changes in the future performance. Thus, a decline in loan loss provisions is in many instances the primary catalyst for increases in profit margins.

Firm size and firm age were incorporated in this study as control variables. Firm's size can usually be seen from the company's total assets and total sales. A company of greater size can give a good signal to the public. This is in accordance with the signalling theory that the greater the firm's size will give a positive signal that the company's financial performance is getting better (Meiryani et al., 2020). The modern financial intermediation theory suggests that there are efficiency gains related to size due to economies of scale which indicate the reduction in production costs. Due to economies of scale, large MFBs are expected to be more profitable as they can spread their costs among many units resulting in low operating costs (Mashamba, 2018). Based on the economies of scale and the signaling hypotheses, this study predicts that size positively influences MFBs performance.

Firm age is also a critical determinant of firm performance based on the industry life cycle. Older companies can build good network of business partners and consumers, and have very good relationship with financial organizations (Kuncová, Hedija & Fiala, 2016). The learning by doing theory posits that increasing knowledge of effective production techniques will improve the performance of the organization. However, the structural inertia theory indicates that as organizations grow, it suffers bureaucratic bottlenecks and inflexibility which may metamorphose into the problem of resistance to change (Sritharan, 2015). However, most studies acknowledge that mature and older firms perform better in comparison to younger ones hence an indication that firm size positively affects firm performance. The variables were operationalized as follows

UT OMNES VNVM SINT

Figure 2. 2 Operationalization of Variables

Variable	Indicators	Operational definitions	Supporting literature	Measurement	Expected Relationship
Performance	Financial performance	FP relates to MFIs sustainability which indicates the ability to be self-sufficient	Amin et al (2018); Hartarska and Nadolnyak (2007).	Return on assets (ROA)	None
	Social performance (outreach)	Social performance of MFIs relates to the degree of outreach	Hartarska and Nadolnyak (2007)	Log of the number of active borrowers	None
Capital regulations	Capital adequacy	It is the amount of capital an MFI has to hold as mandated by regulatory authority	Chortareas et al (2012); Bouheni et al (2014)	Capital adequacy ratio (CAR)	Positive
Liquidity regulations	Liquidity coverage	This is the capacity of an MFI to achieve its obligations to its depositors.	Bonner and Eijffinger (2016);	Liquidity coverage ratio (LCR)	Negative
Loan loss provisioning requirements	Loan loss provisioning	Loan loss provisioning is a measure of MFIs credit quality	Ahmad et al (2014); Alhadab and Alsahawneh (2016).	Loan loss provisioning (LLP) ratio	Positive/ Negative
Microfinance Size	Assets	It's the size of a microfinance in terms of age	Chortareas et al (2012); Dilven (2017)	Natural log (Ln) of assets	Positive
Microfinance age	Years	It's the number of years since incorporation of a microfinance	Dilven (2017); Ahmad et al (2014)	Natural log (Ln) of the number of years since incorporation	Positive

2.8 Chapter Summary

The chapter explored the microfinance schism, which argues that there are two major, schools which govern the approach in which microfinance were viewed as the welfarist's approach and the institutionalists' approach. The chapter also reviewed the public interest theory of regulation, which argues that regulation is aimed at protecting MFIs clients and to enhance the efficiency of the MFIs. The chapter reviewed studies on capital, liquidity and loan loss provisioning regulations and their effect on performance. The study also presented a conceptual model, operationalized the study variables and identified gaps from the reviewed studies.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter brings outs the study's research methodology. These include the research philosophy, design, target population and sampling technique, data collection methods, data analysis, model specification and diagnostic tests.

3.2 Research Philosophy

A research philosophy is a structure of an investigator's thoughts, according to which novel; consistent knowledge concerning a research area is acquired. It entails a research basis which includes the selection of research strategy, problem formulation, collection of data, processing and finally data analysis (Cooper & Schindler, 2014). Two major research philosophies have been identified in the Western tradition of science, namely positivist (sometimes called scientific) and interpretivist (also known as antipositivist). Positivists believe that reality is stable and can be observed and described from an objective viewpoint i.e. without interfering with the phenomena being studied. They contend that phenomena should be isolated and that observations should be repeatable. Interpretivists contend that only through the subjective interpretation of and intervention in reality can that reality be fully understood (Robson & McCartan, 2016).

This study thus adopted a positivism research philosophy. The positivism approach indicates that the social world can be objectively understood. In the philosophy, an investigator is an objective analyst, usually distances himself from personal beliefs and works autonomously (Saunders, Lewis & Thornhill, 2009). This study was quantitative in nature hence the choice of the positivism approach. Positivism relates to the philosophical stance of the natural scientist and entails working with an observable social reality to produce law-like generalizations. This study seeks to examine whether prudential regulations affect

performance of microfinance banks hence a positivism research philosophy shall aid to establish the interrelationship and to collect quantitative and numerical data.

3.3 Research Design

A research design is the researcher's plan of how to proceed to gain an understanding of some group or some phenomenon in its context (Cooper & Schindler, 2007). To achieve this study's objectives, a descriptive research design was employed. Descriptive research involves the collection of information from all the sampled individuals through their responses to questions (Sekaran & Bougie, 2010). A descriptive design attempts to collect data from members of a population in order to determine the current status of that population with respect to one or more variables. As such, a descriptive design describes characteristics of objects, people, groups, organizations, or environments. In addition, descriptive research expounds the data and attributes of a phenomenon or population under investigation (Robson & McCartan, 2016). A descriptive design thus aided in collecting data in order to test hypotheses and to answer questions concerning the relationship between regulations and performance of microfinance institutions in Kenya.

3.4 Population and Sampling

A population is a cluster of individuals or objects with similar noticeable features (Cooper & Schindler, 2014). This study's population comprised of the 13 deposit taking MFIs in Kenya as at 31st December 2020. The study thus carried out a census of the 13 DTMs. Cooper and Schindler (2007) posits that a census is conceivable for a small population and is necessary when the elements are not similar. Thus, since the DTMs, population is small and the entities are accessible with certainty it will be suitable to use a census. Table 3.1 shows the population distribution

Table 3. 1 Population Distribution

Category	MFB	Market share (%)
Large	Faulu MFB	39.2
	Kenya Women MFB	36.9
	Rafiki MFB	8.5
Medium	SMEP MFB	4.6
	Maisha MFB	3.4
	Caritas MFB	2.5
	Sumac MFB	2.3
	U & I MFB	1.1
Small	Key MFB	0.7
	Uwezo MFB	0.4
	Century MFB	0.4
	Daraja MFB	0.1
	Choice MFB	0

Source: Central Bank of Kenya (2020)

3.5 Data Collection Methods

This study entirely used panel secondary data that was gathered through a data collection sheet. Data on capital requirements (capital adequacy ratio), liquidity requirements (liquidity coverage ratio), loan loss provisioning, firm size (total assets), firm age (number of years since incorporation) and financial performance (Operational self-sufficiency (OSS) ratio) was obtained from the individual microfinance banks financial statements. Data on the MFBs social performance (outreach) was sourced from the Association of Microfinance Institutions (AMFI) of Kenya. The data was collected for a period of seven years from 2014 to 2020 and covered the period after MFBs regulations were adopted. The year 2014 was considered since it was the first year after the change of political regime from old form of governance to new model. Being an attribute of business environment, there was need for examination of effect of prudential guidelines on social and financial performance of micro finance banks in Kenya.

3.6 Data Analysis

Data analysis was undertaken through descriptive and inferential statistic using the STATA statistical software. Descriptive statistical tools were used to organize and summarize the collected data into a meaningful form and entailed measures like the mean, maximum, minimum and standard deviation. Inferential statistics entailed correlation analysis and the regression analysis. Correlation analysis was used to describe the degree and strength of association among the variables while regression was used to assess the relation between the response and explanatory variables. The analyzed data was presented in graphs and tables.

3.7 Model Specification

The study used the panel data methodology for analysis. Panel data refers to cross-sectional and time series data set that allows repeated measurements of a number of variables over a period of time on observed units (Baltagi, 2008). Panel data analysis allows a researcher to generate comparatively high statistical levels of validity in program evaluation and policy analysis using a more elaborate research design than analytical techniques that use cross-sectional data. The panel data methodology comprises of a pooled OLS, fixed effect and the random effect model. The panel data equations were formulated as follows

$$FP_{it} = \beta_{it} + \beta_1 CAR_{it} + \beta_2 LIQ_{it} + \beta_3 LLP_{it} + \beta_4 Size\ (Ln\ Total\ assets)_{it} + \beta_5 Age(Ln\ Age)_{it} + \epsilon_{it} \quad \text{Equ 3.1}$$

$$SP_{it} = \beta_{it} + \beta_1 CAR_{it} + \beta_2 LIQ_{it} + \beta_3 LLP_{it} + \beta_4 Size(Ln\ Total\ assets)_{it} + \beta_5 Age(Ln\ Age)_{it} + \epsilon_{it} \quad \text{Equ 3.2}$$

Where;

FP_{it} = Financial performance for microfinance bank ‘i’ at time‘t’

SP_{it} = Social performance for microfinance bank ‘i’ at time‘t’

CAR_{it} = Capital adequacy ratio for microfinance bank 'i' at time't'

LIQ_{it} = Liquidity ratio for microfinance bank 'i' at time't'

LLP_{it} = Loan loss provision for microfinance bank 'i' at time't'

$Size_{it}$ = Ln (Total assets) of an microfinance bank 'i' at time 't'

Age = ln (Age) of a microfinance bank 'i' at time 't'

β_{it} = Constant

β_1- β_5= Regression coefficients

ε = error term

3.7 Diagnostic Tests

Various assumptions are normally made relating to the panel data regression model. Such diagnostics are necessary as they show whether the panel data estimation technique has desirable properties hence hypothesis testing concerning the coefficient estimates will be reliably estimated. Thus, a number of pre-estimation and post estimation specification tests. The main pre-estimation specification tests included normality, autocorrelation, homoscedasticity and multicollinearity tests. The Hausman test was the only post estimation technique that was undertaken.

The assumption of normality determines how likely it is that the data set will be distributed normally (Baltagi, 2008). Normality was assessed using the Shapiro-Francia test. The

assumption of homoscedasticity indicates that the error terms should be similar for the values of independent variables (Baltagi, 2008). The Breusch-Pagan/Cook-Weisberg test was used to assess homoscedasticity, where a significant P-value is an indication of heteroscedasticity. Autocorrelation occurs when the error terms of the observation pair are not independent of each other (Wooldridge, 2015). The study used the Wooldridge test to assess for serial correlation.

Multicollinearity suggests that at least two independent variables are closely related in a research model (Baltagi, 2008). Because of multicollinearity, regression coefficients are biased and unstable making it difficult to interpret them. A correlation matrix as well as the variance inflation factors (VIF) was used for multicollinearity testing where a VIF greater than 10 and a correlation coefficient greater than 0.7 was an indicator of multicollinearity.

Stationarity of data is necessary in panel and time series data analysis as it enhances forecasting and description of future behavior based on the analysis statistics. Time series data can either be stationary or non-stationary. Gujrati (2014) posits that stationary data is a data whose mean and variance are constant over time and whose value for the covariance between two periods depends only on the distance or gap or delay between the two periods and not on the actual time in which the covariance is calculated. A characteristic of stationary time series data is that it does not have unit roots (Garson, 2012). The Fisher-type unit-root was used for stationarity testing.

The Hausman test was performed to determine the appropriate model between the random and the fixed effects models. The fixed effects model is often used to control omitted variables that are constant at all times and vary between units. The random effects model concerns unobserved heterogeneity as a random variable rather than a fixed one (Baltagi, 2008). The Hausman test thus compares fixed and random effects with the null hypothesis that individual effects are independent of other explanatory variables. If the null hypothesis is not rejected, it is preferable to use random effects. However, if rejected, the fixed effects model is better than the random effects.

CHAPTER FOUR
PRESENTATION OF RESEARCH FINDINGS

4.1 Introduction

The aim of this study was to determine the effect of prudential regulations on social and financial performance of microfinance banks in Kenya. The study entirely used panel secondary data that was gathered through a data collection sheet from 13 microfinance banks for a period of seven years from 2014 to 2020. The study managed to collect unbalanced panel data from the 13 MFBs leading to 86 data points. Complete data was obtained from nine MFBs, which included Faulu, KWFT, Rafiki, SMEP, Key, Uwezo, U&I, Century and Sumac. Daraja and Choice MFBs had been in existence for 6 years hence the data was collected for period of 6 years (2015-2020) while Caritas and Maisha MFBs had been in existence for 5 years hence data was collected for 5 years (2016-2020) respectively.

This chapter therefore presents the study results and findings of the analysed data. The chapter includes descriptive statistics results, exploratory data analysis and diagnostic tests results. The chapter further presents correlation analysis, regression analysis and the chapter summary.

4.2 Descriptive Statistics

Descriptive statistical tools such as the mean, standard deviation, minimum and maximum value were used to summarize the collected study data. Table 4.1 shows the findings

Table 4. 1 Descriptive Statistics

Variable	Obs	Mean	Median	Std. Dev.	Min	Max
Dependent variables						
ROA	86	-0.098	-0.0405	0.152	-0.602	0.0489
Outreach	86	0.407	0.7233	0.97	1.155	2.412
Independent variables – test variables						
Capital adequacy	86	0.268	0.27	0.515	-2.54	1.45
Liquidity	86	0.371	0.29	0.303	0.01	2.17
LLP	86	0.065	0.2	0.072	0	0.463
Independent variables – control variables						
Bank size (Ln of assets)	86	3.639	5.421	1.953	1.732	7.509
Bank age (Ln of age)	86	4.651	4.5	2.552	1	12

Table 4.1 shows that average value for ROA was -0.098(SD=0.152) with a median value of -0.0405, minimum value of -0.602 and a maximum value of 0.049. This shows that the average ROA for the MFBs over the study period was -9.8% hence an indication that MFBs had been making losses. The minimum value of -0.602 indicates that some of the MFBs had made losses over the study period. Outreach (measured through the log of active borrowers) had a mean value of 0.407(SD=0.970) with minimum and maximum values of 1.155 and 2.412 respectively and a median of 0.7233. The average value of capital adequacy (capital adequacy ratio) was 0.268 (SD=0.515) with minimum and maximum values of -2.54 and 1.45 respectively as well as a median of 0.2700. This indicates that the average capital adequate ratio for the MFBs was 26.8%, which is higher than the recommended threshold of 14.5% indicating that that most of the MFBs are highly capitalized. Regulatory capital requirements set out minimum ratios of capital that banks must maintain. However, increasing capital requirements can lead some MFBs to cut lending in the short run. The minimum value of -2.54 shows that some MFBs had a negative capital adequacy ratio indicating a breach of capital requirements.

Liquidity had an average value of 0.371 (SD=0.303) with minimum and maximum values of 0.01 and 2.17 respectively and a median of 0.2900. The finding indicates that the average liquidity for the MFBs was 37%, which is higher than the recommended threshold of 20% indicating that most of the MFBs were liquid. Although liquidity enables financial entities to meet their current obligations when they arise, such high liquidity levels by the MFBs reduces their profitability. The minimum value of 0.01 indicates that some of the MFBs had fell short of the 20% liquidity threshold. Loan loss provisioning (LLP) had an average value of 0.065 (SD=0.072) with minimum and maximum value of 0 and 0.463 respectively. This indicates that the average LLP ratio was 6.48 while the minimum value of zero indicates that some MFBs did not have loan loss provisions. Bank size had an average value of 3.639(SD=1.953) with minimum and maximum values of 1.732 and 7.509 respectively. Median bank size was 5.421. Bank age had an average value of 4.651 and standard deviation of 2.552 with minimum value of 1 and 12 respectively and a median value of 4.500.

4.3 Graphical Analysis

Graphical analysis is an essential step in any research analysis. The primary aim with this analysis is to examine the data for distribution, outliers and anomalies to direct specific testing of one's hypothesis. It also provides tools for hypothesis generation by visualizing and understanding the data usually through graphical representation. In this study, graphical analysis was undertaken through panel plots. The results were as follows

4.3.1 ROA Panel Plots

Figure 4.1 depicts the ROA panel plots for the individual microfinance banks over the study period

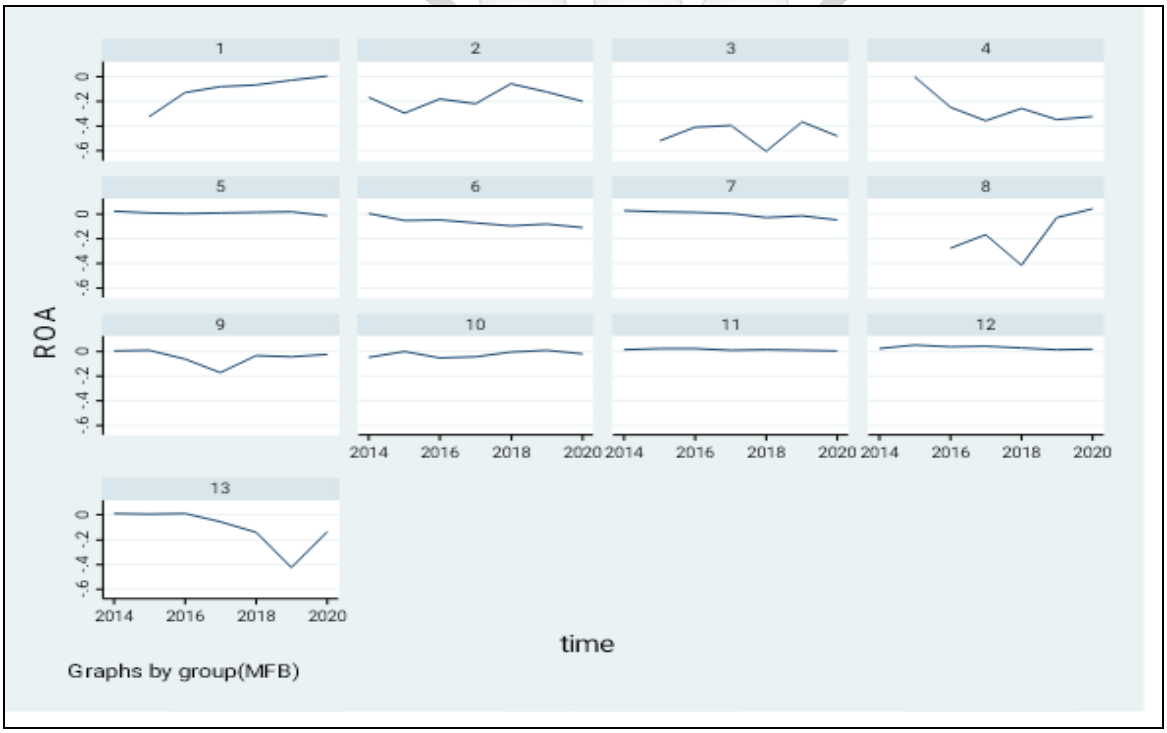

Figure 4. 1 ROA Panel Plots

Figure 4.1 shows that ROA changed significantly in across all the sampled firms apart from MFB 2, 3, 8 and 13, which had slumps and humps. ROA provides an indication of the ability of an MFB to generate a commercially acceptable rate of return that would enable it to access commercial financing hence it may increase or fall over in some years. The slumps and humps therefore indicate that some MFBs made profit in some years and losses in other

years. From the plots, it evident that most MFBs had been making loses over the years as most panel plots are below the 0.0 level indicating that the sector is facing a myriad of financial performance challenges which could be attributed to the stringent regulatory framework which is similar to that of commercial banks despite most of them being smaller in size.

4.3.2 Outreach Panel Plots

Figure 4.2 shows the panel plots for outreach (log of active borrowers) over the study period for individual microfinance banks.

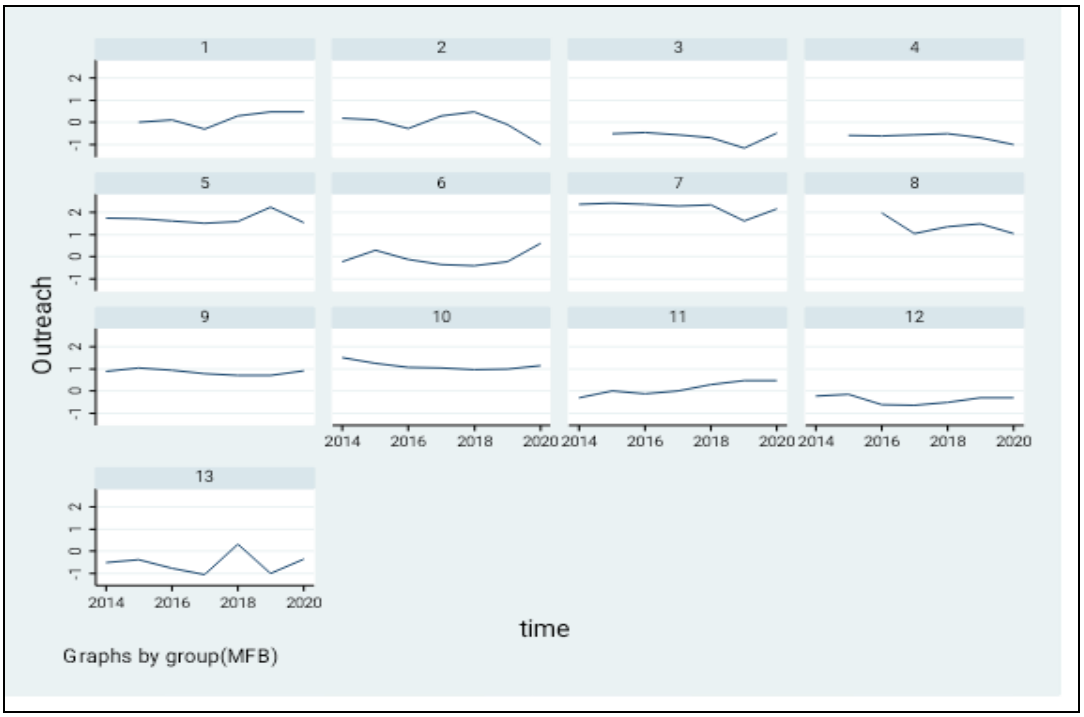

Figure 4. 2 Outreach Panel Plots

Figure 4.2 indicates that the number of active borrowers (outreach) changed significantly across all the MFBs apart from MFB 8 and 13 that had slumps and humps. Outreach indicates the social benefits of microfinance, at times, an MFB may offer large amounts of loans, and at times lower amounts, thus the number of borrowers may vary with time. The humps and the slumps therefore indicate that the number of active borrowers dropped in some years followed by a sharp increase or decrease in the subsequent years. The graphical

plots indicates that outreach by microfinance institutions has been sluggish over the years indicating that their penetration and services are yet to reach majority of the unbanked poor Kenyan especially in rural areas.

4.3.3 Capital Adequacy Panel Plots

Figure 4.3 indicates the capital adequacy ratio (CAR) panel plots for the 13 MFBs between 2014 and 2020.

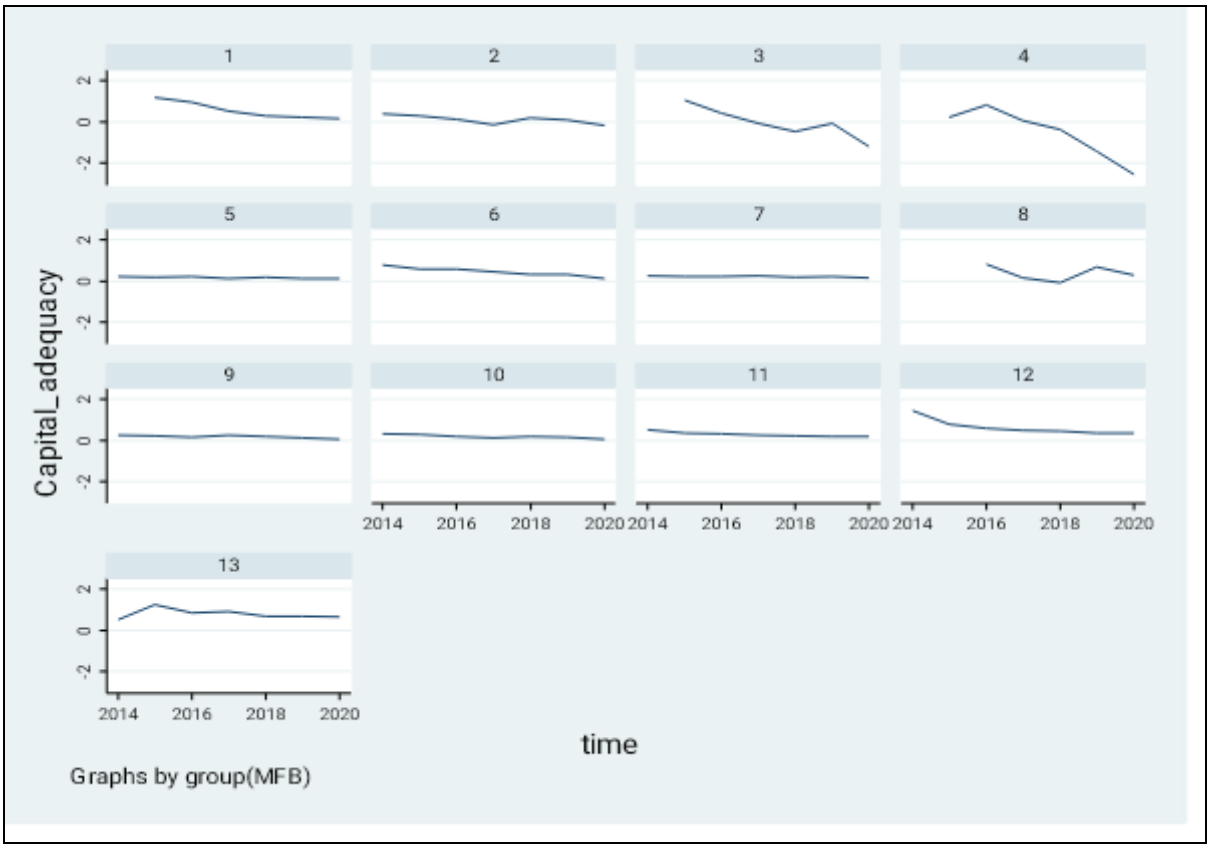

Figure 4. 3 Capital Adequacy Panel Plots

The findings on Figure 4.3 indicates that the 13 MFBs exhibited a similar capital adequacy ratio trend over the years apart form MFB 3, 4 and 12 which exhibited a decline in the ratio as well as MFB 8 which had lumps and slumps in some years. Financial entities usually experience a drop in their capital base to changes in capital risk, management activities as well as economic conditions. From the graphs, it is evident that majority of the MFBs have been able to attain the minimum required liquidity levels which indicates that the institutions

focus more on adhering to prudential requirements at the expense of outreach and financial performance.

4.3.4 Liquidity Panel Plots

Figure 4.4 depicts the liquidity (liquidity ratio) panel plots over a specific period of seven years for individual microfinance banks.

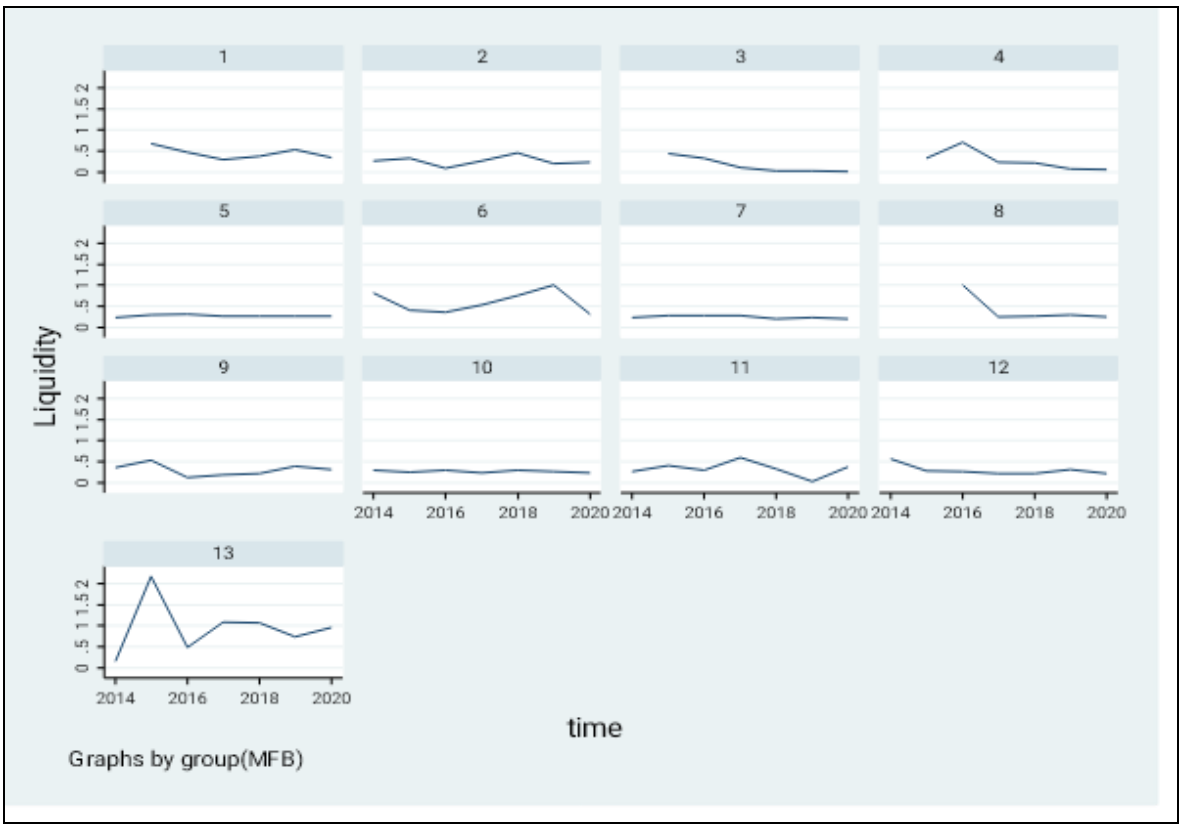

Figure 4. 4 Liquidity Panel Plots

Figure 4.4 indicates that the data set from the 13 MFBs exhibited a similar trend for the study period with exception to MFB 4, 6, 8 and 13, which had slumps and hampers in some of the years. This indicates that MFBs liquidity increased and decreased in some of the years due to various factors facing the entities. Changes in liquidity are a common occurrence in financial institutions due to changes in short term investments and other liquid assets held by an MFB. From the plots is clear that majority of the MFBs were liquid and had not breached the liquidity requirements by the Kenyan central bank hence an indication that the MFBs hold

high liquidity levels which could have adverse effects on the profitability owing to the profitability-liquidity trade-off.

4.3.5 LLP Panel Plots

Figure 4.5 depicts the loan loss provisioning (LLP ratio) trend for the 13 MFBs over the period under consideration in the study.

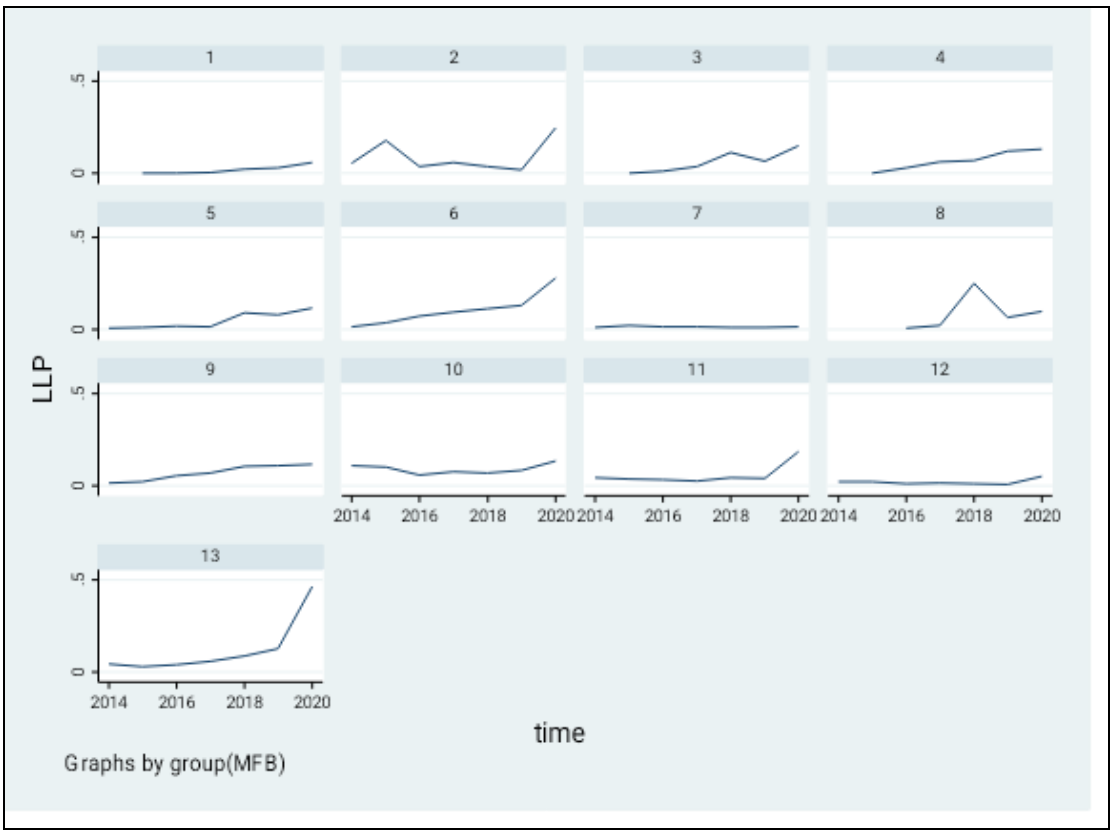

Figure 4. 5 LLP Panel Plots

The panel plots in figure 4.5 show that there was significant change in loan loss provisioning by the 13 MFBs except MFB 2, 8 and 13 that recorded slumps and humps in some of the years. LLP indicates a specific amount as set aside by bank managers to absorb expected loss on banks' loan portfolio and is a credit risk-managing tool used by banks to mitigate expected losses on bank loan portfolio. Therefore, the witnessed slumps and humps indicate that in some periods the MFBs increased their loan loss provisioning while in other times they decreased the amounts of provisions. Generally, the above plots indicate that the level of

nonperforming loans had been gradually increasing among the MFBs hence an indication of reduction of interest income which adversely affects their financial performance.

4.3.6 Panel Plots for MFB Size

Figure 4.6 depicts the various panel plot of the MFBs size in terms of assets for the 13 entities for the considered study period.

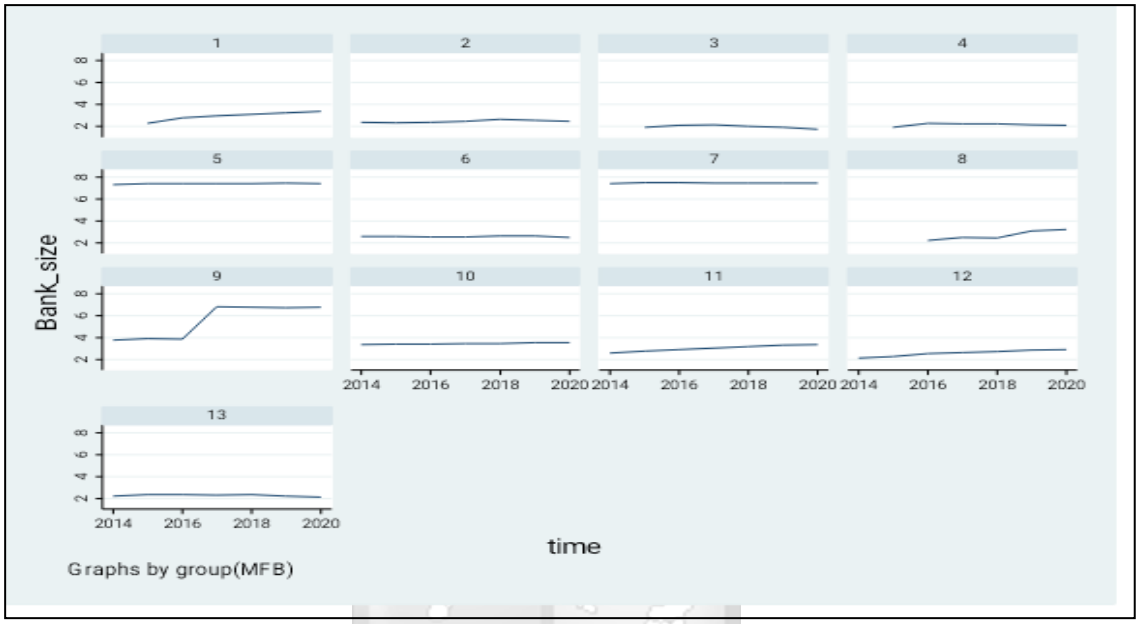

Figure 4. 6 Panel Plots for MFB Size

Figure 4.6 indicates that the MFBs size (measured in terms of assets) exhibited a similar trend of the considered study years with exception to MFB9, which recorded a sharp increase in assets in 2017. This indicates that the MFB invested in more assets or expanded its operations hence the reason behind the increase in its assets. The single outlier however does not have any effect on panel data regression as the organization increases their assets base, they grow their firms to enjoy the benefits of economies of scale. Generally, the panel plots indicate that the MFBs have been growing in terms of assets.

4.3.7 Panel Plots for Firm Age

Figure 4.7 depicts the panel plots of the MFBs age (measured by the number of years the MFBs had been in existence) for the individual firms.

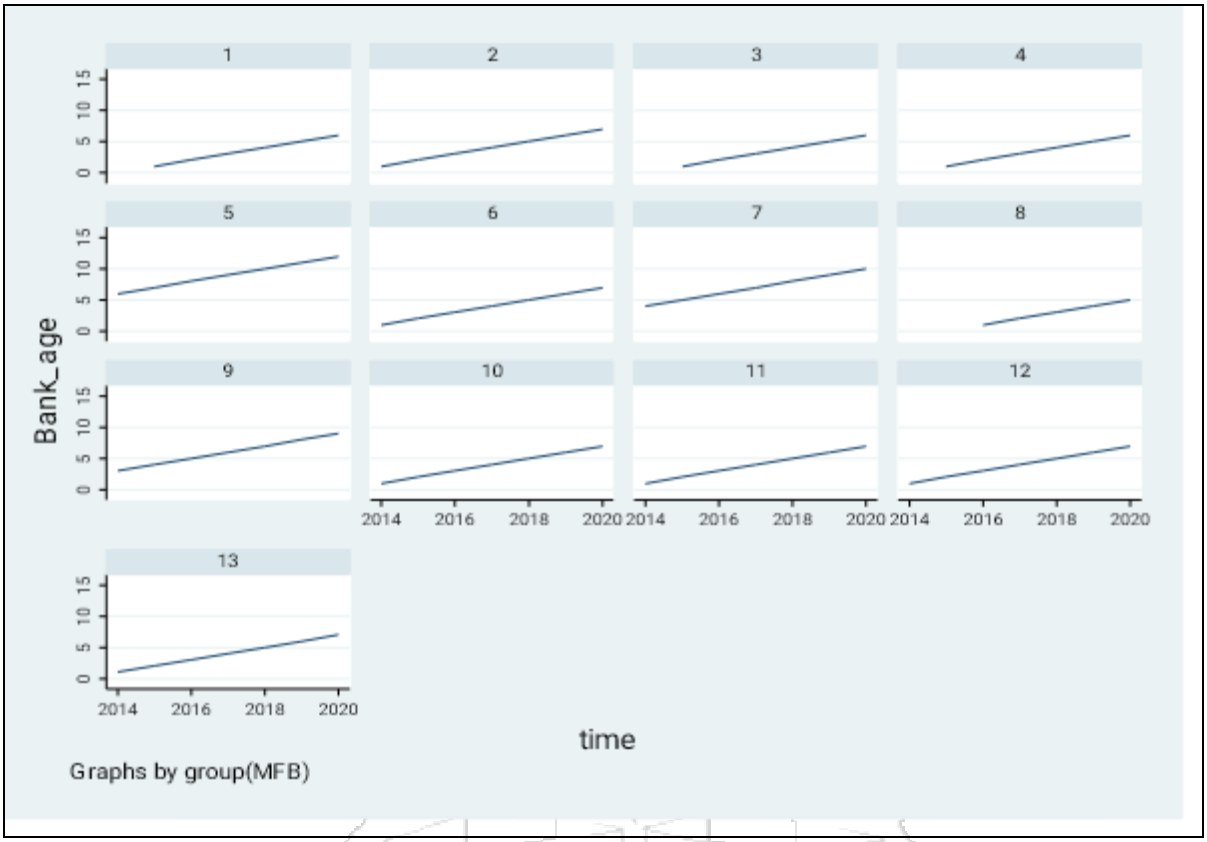

Figure 4. 7 Panel Plots for Firm Age

Figure 4.7 shows that the age of the 13 MFBs had significantly increased over the years hence an increasing trend across all the entities. Although, MFIs have been operating in Kenya for more than 30 years the first MFB (back then referred to as deposit taking microfinances) was licensed and began its operations in 2009). Thereafter, the number of MFBs increased to two in 2010 and they had reached nine by the year 2015. Thus, despite negative ROA in the sector, the sector is not saturated and openings still exists for additional MFBs.

4.4 Diagnostic Tests

The regression model is based on several assumptions such as normality, homoscedasticity, autocorrelation, multicollinearity and stationarity. If these assumptions are violated, then a very cautious interpretation of the fitted model would be advised. This study therefore undertook various diagnostic tests to ensure that the data set is appropriate and none of the assumptions has been violated.

4.4.1 Normality Test

Normality test is undertaken to determine how likely the data set is to be normally distributed. Normality means that the distribution of the test is normally distributed (or bell-shaped) with zero mean, with a standard deviation of one and a symmetric bell-shaped curve. The normality assumption states that the residual values are normally distributed in the population (Baltagi, 2008). Normality was assessed using the Shapiro-Wilk test for residuals. Table 4.2 shows the normality test results

Table 4. 2 Normality Test

	Variable	Obs	W	V	z	Prob>z
Model 1	Residuals	86	0.982	1.301	0.578	0.282
Model 2	Residuals	86	0.988	0.867	-0.315	0.624

Table 4.2 above shows the normality test using the Shapiro-Wilk test for residuals. The results show that the P-values of 0.282 and 0.624 in both models were more than the probability value of 0.05. This finding indicates that the data is normally distributed and the normality assumption has not been violated.

4.4.2 Homoscedasticity Test

This assumption indicates that the residuals are distributed equally for all predictor variables. In a model, it means that the error is constant along the values of the dependent variable. If the assumption is violated, then you will have heteroscedasticity. When the model consists of the problem of heteroscedasticity, the OLS estimator is no longer BLUE. Besides, the presence of heteroscedasticity causes standard errors to be biased. As a result, the confidence interval and test hypothesis tend to be biased; eventually the overall results may be

misleading (Hickey et al., 2019). The Breusch-Pagan test was used to assess homoscedasticity as depicted under table 4.3 below.

Table 4. 3 Homoscedasticity Test

	Model 1	Model 2
chi2(1)	4.49	0.02
Prob > chi2	0.0341	0.9019

The homoscedasticity test results in table 4.3 indicates that the first model's (model 1) P-value was 0.0341<0.05. This indicates that data set is heteroscedastic. However, to remedy this problem, the study used robust standard errors in the final model. The p-value under the second model (model 2) was 0.9019>0.05 which indicate that the data is homoscedastic and the data set does not violate the assumption of homogeneity of variances.

4.4.3 Autocorrelation Test

The autocorrelation assumption indicates that residuals should be independent from each other. Autocorrelation arises when the disturbances are correlated with one another. In other words, an independently distributed error term for a particular period is not related to the error term of previous period, regardless of sign and size of the error term. Otherwise, the assumption of independence of error term is violated (Baltagi, 2008). This study used the Wooldridge test to assess for serial correlation. Table 4.4 below shows the results.

Table 4. 4: Autocorrelation Test

	Model 1	Model 2
F(1, 12)	1.037	0.163
Prob > F	0.328	0.693

Table 4.4 above indicates that there was no autocorrelation in both models as the calculated P-values of 0.328 and 0.693 were more than 0.05 significance value. The finding therefore indicates that the autocorrelation assumption has not been violated and the study rejects the null hypothesis that autocorrelation does not exist in the data set.

4.4.4 Multicollinearity Test

Multicollinearity means that there are at least two independent variables in the model that are correlated and provide redundant information about the response. The existence of this problem causes larger variances and covariance therefore affect the significance of t-statistics. It reduces the reliability of the data information and leads to confusing and biased results (Hickey et al., 2019). The variance inflation factors (VIF) was used for multicollinearity testing. Table 4.5 below shows the results

Table 4. 5: Multicollinearity Test

Variable	Model 1		Model 2	
	VIF	1/VIF	VIF	1/VIF
Bank age	2.86	0.349	2.86	0.349
Bank size	2.59	0.385	2.59	0.385
Capital adequacy	1.76	0.567	1.76	0.567
Liquidity	1.53	0.654	1.53	0.654
LLP	1.45	0.687	1.45	0.687
Mean VIF	2.04		2.04	

The multicollinearity results in table 4.5 above indicates that all the VIF values under both models were less than the recommended cut off value of 10. This finding therefore indicates that there is no collinearity among the study variables hence the multicollinearity assumption has not been violated.

4.3.5 Stationarity Test

The stationarity test is undertaken to establish if time series are stationary before analyzing the data. A series is regarded as a non-stationary series if it lacks a unit root problem. The Fisher-type unit-root was used for stationarity testing. Table 4.6 below depicts the results.

Table 4. 6 Stationarity Test

Variable	Inverse chi-squared (P)	Inverse normal (Z)	Inverse logit t (L*)
ROA	77.69 (0.000)	-3.39 (0.000)	-4.75 (0.000)
Outreach	57.48 (0.000)	-1.59(0.055)	-2.30 (0.012)
Capital adequacy	104.99 (0.000)	-2.31 (0.010)	-5.73(0.000)
Liquidity	191.62 (0.000)	-8.09 (0.000)	-14.21(0.000)
LLP	94.18 (0.000)	-2.89(0.000)	-4.91(0.000)
Bank size (Ln of assets)	83.53(0.0000)	-2.75(0.0030)	-4.42(0.000)
Bank age (Ln of age)	937.13(0.0000)	-29.29(0.0000)	-72.18(0.000)

*P values in brackets

Since the study obtained unbalanced panel data, stationarity test was undertaken using the Fisher-type unit-root. The results in table 4.6 above show that variables were stationary as all the p-values under the inverse chi-squared, inverse normal and the inverse logit t were less than 0.05 significance value. The finding therefore indicates that the study's data set was stationary hence; the unit root assumption has not been violated.

4.3.6 Hausman Test

The Hausman test was performed to determine the appropriate model between the random and the fixed effects models. The test helps to determine whether to use fixed or random effects model. Table 4.7 below depicts the results.

Table 4. 7 Hausman Test

	Model 1	Model 2
chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)	3.48	18.45
Prob>chi2	0.6266	0.0024
Interpretation	REM is appropriate	FEM is appropriate

The Hausman test aids in establishing which model is appropriate in fitting the regression coefficients and testing of the null hypothesis. Under the test, if p – value < 0.05, (H_1 is true) then FEM will be appropriate to use while p – value > 0.05 ($H0$ is true) REM will be appropriate to use. In this study, Model 1 had P-value of 0.6266>0.05 indicating that the random effects model was appropriate while Model 2 had a P-value of 0.0024<0.05 which indicated that fixed effect model was appropriate.

4.4 Correlation Analysis

Pearson Correlation analysis was used to describe the degree and strength of association among the variables. Pearson correlation evaluates the linear relationship between two continuous variables unlike the Spearman correlation which evaluates the monotonic relationship. The Spearman correlation coefficient is based on the ranked values for each variable rather than the raw data. Table 4.8 below shows the correlation matrix.

Table 4. 8 Correlation Matrix

	ROA	Outreach	Capital adequacy	Liquidity	LLP	Ln (Bank size)	Ln (Bank age)
ROA	1						
Outreach	0.399*	1					
	0.00						
Capital adequacy	0.314*	0.012	1				
	0.003	0.909					
Liquidity	0.087	-0.158	0.533*	1			
	0.424	0.145	0.00				
LLP	-0.249*	-0.131	-0.265*	0.046	1		
	0.02	0.228	0.013	0.668			
Ln (Bank size)	0.419*	-0.792*	-0.064	-0.206	-0.17	1	
	0.00	0.00	0.553	0.056	0.115		
Ln (Bank age)	0.212*	0.416*	-0.348*	-0.21	0.262*	0.677*	1
	0.049	0.00	0.001	0.051	0.014	0.00	

*. Correlation is significant at the 0.05 level (2-tailed).

The correlation results under table 4.8 above shows that the correlation between capital adequacy and the MFBs financial performance (ROA) was weak, positive and significant (r=0.314; P-value=0.000<0.05) whereas the correlation between liquidity and MFBs ROA was weak, positive and significant (r=0.087; P-value=0.424>0.05) respectively. In addition, LLP had a weak, negative and significant (r=-0.249; P-value=0.020<0.05) correlation with the MFBs ROA. Further, bank size had a weak, positive and significant (r=0.419; P-value=0.000) correlation with the MFBs ROA whereas bank age had a weak, positive and significant (r=0.212; P-value=0.049) correlation with the MFBs ROA respectively.

The results further indicate that capital adequacy had a weak, positive and insignificant (r=0.012; P-value=0.909>0.05) correlation with MFBs outreach while liquidity had a weak, negative and insignificant (r=-0.158; P-value=0.145>0.05) correlation with outreach respectively. LLP on the other hand had a weak, negative and insignificant (r=-0.131; P-value=0.228>0.05) correlation with outreach. However, bank size had a strong, negative and significant (r=-0.792; P-value=0.000<0.05) correlation with outreach while bank age had a weak, positive and significant (r=0.416; P-value=0.000<0.05) correlation with outreach respectively. All the correlation coefficient values under both models are less than 0.8, which indicates that there is no collinearity among the study variables.

4.5 Regression Analysis

Linear Regression model was used to assess the relationship between the response and explanatory variables. Specifically, the model was used to link between the independent variables (capital adequacy, liquidity and LLP), the control variables (bank size and age) and the dependent variables (financial (ROA) and social (outreach) performance). Relationship with ROA was investigated using the random effects model while relationship with Outreach was investigated using the fixed effects model. Table 4.9 and 4.10 below shows the findings.

Table 4. 9 Random-Effects GLS Regression (Model I)

	Dependent variable – ROA			
Variables	**Model I (a)**	**Model I (b)**	**Model I (c)**	**Model I (d)**
Capital adequacy	.0187 (0.63)			.0243 (0.96)
Liquidity		.0104 (0.50)		-.0051 (-0.18)
LLP			-.4769 (-2.13)*	-.4886 (-2.19)*
Ln (Bank size)	-.0066 (-0.91)	-.0070 (1.02)	.0025 (0.26)	.0033 (0.37)
Ln (Bank age)	.0299 (1.12)	.0351 (1.56)	.0239 (1.17)	.0182 (0.89)
_cons	-.1892 (-1.96)**	-.2023 (-2.21)*	-.1710 (-1.98)**	-.1614 (-2.07)*
R-square (overall)	0.1927	0.1926	0.2051	0.2169
Wald chi2	6.29***	3.3	20.41*	30.88*
Prob > chi2	0.0984	0.3483	0.0001	0.000
No. of observations	86	86	86	86

t values in parentheses; P-values presented in *** <0.1, ** <0.5 and *<0.05

The first model (model 1) examined the link between microfinance regulations (capital adequacy, liquidity and LLP), Control variables (bank size and age) and the MFBs financial performance (ROA). The findings on table 4.9 above indicates that the overall R square value (coefficient of determination) was 0.2169 which indicates that capital adequacy, liquidity, LLP bank size and age explain 21.69% of the variation in the MFBs financial performance (ROA). The Wald chi2 value of 30.88 was statistically significant as indicated by the P-value of 0.000<0.05. This indicates that the regression model was fit and appropriate for the study. Further, the findings indicated that capital adequacy had a positive (β=0.0243) and insignificant (0.336>0.05) effect on ROA while liquidity had a negative (β =-0.0051) and insignificant (P-value=0.854>0.05) effect on ROA. On the other hand, LLP had a negative (β =-0.4886) and significant (P-value=0.028<0.05) effect on ROA. Thus, unit increase in LLP decreases ROA by 0.4886 units. Bank size had a positive (β =0.0033) and insignificant (P-value=0.710>0.05) effect on ROA whereas bank age positively (β = .1434) and insignificantly (P-value=0.375 >0.05) affected ROA respectively.

Table 4. 10: Fixed-Effects (Within) Regression (Model II)

	Dependent variable – Outreach			
Variables	**Model II (a)**	**Model II (b)**	**Model II (c)**	**Model II (d)**
Capital adequacy	.0979 (0.70)			.0358 (0.27)
Liquidity		.6399 (3.84)*		.6189 (3.62)
LLP			-.8399 (-1.13)	-.6189 (-0.89)
Ln (Bank size)	-.1268 (-5.46)*	-.113 (-5.27)*	-.1112 (-4.05)*	-.1008 (-3.93)*
Ln (Bank age)	.1558 (1.59)**	.1539 (1.72)**	.1409 (1.43)	.1434 (1.58)**
_cons	.2513 (0.75)	-.0028 (-0.01)	.3276 (1.00)	.0110 (0.03)*
R-square (overall)	0.0955	0.3658	0.1374	0.3386
F	10.62*	17.47*	10.99*	10.47*
Prob > chi2	0.000	0.000	0.000	0.000
Number of observations	86	86	86	86

t values in parentheses; P-values presented in *** <0.1, ** <0.5 and *<0.05

The second model examined the link between microfinance regulations (capital adequacy, liquidity and LLP), Control variables (bank size and age) and the MFBs social performance (outreach). The results in table 4.10 indicates that the overall R square value was 0.3386, which indicates that capital adequacy, liquidity, LLP bank size and age explain 33.86% of the variation in the MFBs social performance (Outreach). The F statistics value of 10.47 was

statistically significant as indicated by the P-value of 0.000<0.05. This indicates that the regression model was fit and appropriate for the study. Further, the finding revealed that capital adequacy had a positive (β =0.0357) and insignificant (P-value=0.786>0.05) effect on outreach whilst liquidity had a positive (β =0.6189) and significant (P-value = 0.001<0.05) effect on outreach. LLP on the other hand had a negative (β =-0.6189) and insignificant (P-value=0.377>0.05) effect on outreach. Bank size had a negative (β =-0.1007) and significant (P-value=0.000<0.05) effect on outreach while bank age had a positive (β =0.1434) and insignificant effect (P-value=0.119>0.05) on outreach correspondingly.

4.6 Chapter Summary

This chapter presented the results of the analyzed data. Specifically, the chapter summarized the study data suing descriptive statistical tools such as the mean, standard deviation, maximum and minimum values under the finding where presented under table 4.1. In addition, the study undertook exploratory data analysis in which the variables trends were reviewed. Further, various diagnostics tests were undertaken under which the data was found to be normally distributed, was homoscedastic, with no serial correlation, without multicollinearity and was stationary.

The chapter also presented the correlation analysis results under which the strength and degree of association was established. Majority of the independent variables apart from bank size had a weak correlation with the respective dependent variables (ROA and outreach) which was an indication that the variables were not highly collinear. Further, the Hausman test was undertaken which indicated that the REM approach was best suited for the first model while the FEM approach was best suited for the second model. Both models were used to establish that the interrelationship between the variables. Under model 1, only LLP had a significant effect on ROA while under model 2, liquidity and bank size had a significant effect on outreach.

CHAPTER FIVE

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a discussion and interpretation of the study findings as per the specific objectives and the study conclusion. The chapter further presents the study recommendations, limitations and areas that may require additional research.

5.2 Discussion of the Findings

This study aimed at examining whether prudential regulations affected MFBs financial and social performance. Specifically, the study focused on capital requirements, liquidity regulations, loan loss provisioning, as well as firm age, size, and their effect on MFBs performance.

5.2.1 Capital Regulations and Performance

The descriptive statistics show that most of the MFBS were highly capitalized and that the sector was making losses with most MFBs yet to break even. According to Chortareas et al (2012), interventionist regulatory and supervisory guidelines like capital restrictions might lead to greater inefficiency in the banking sector. Theoretically, the microfinance schism supports that regulation is not necessary as regulatory compliance requirements divert attention from serving the poor to lending to wealthier clients in order to meet financial performance requirements. Gudmundsson et al. (2013) indicates that capital adequacy as an instrument limits excessive risk taking of bank owners with limited liability and, thus, promoting optimal risk sharing between bank owners and depositors.

Further, the study findings documented that capital regulation (proxied by the capital adequacy ratio) positively but insignificantly affected the MFBs financial as well as social performance. The findings do not support that a unit increase in capital regulation significantly affects MFBs performance in Kenya hence, the study adopts the null hypothesis that capital regulations insignificantly affect Kenyan MFBs performance. Various studies have however documented various results on the link between capital regulations and bank

performance. For instance, Bouheni et al (2014) supported that strengthening capital guidelines and supervision increases bank profitability and enhances stability. Gudmundsson et al. (2013) also documented a positive relationship between capital regulation and the performance and financial stability of banks. The findings supports buffer capital theory.

5.2.2 Liquidity Regulations and Performance

Descriptive statistics results revealed that most MFBs maintained a higher liquidity ratio than that prescribed by regulations. Although liquidity enables financial entities to meet their current obligations, very high liquidity reduces profitability. From a theoretical perspective, the microfinance schism argues regulation can hold back inventions in lending technologies, which advances MFIs' ability to serve poor customers and to expand outreach. Mio (2018) documented that tightening of liquidity regulation had no impact on the bank overall financial performance. In addition, Adusei (2021) indicates that the free cash flow theory argues that high liquidity provides more opportunities for managers to indulge in more self-aggrandizement by engaging in low-benefit projects and other tendencies that ultimately leads to poor performance.

Further, the study results documented that liquidity had an insignificant negative effect on the MFBs financial performance but a significant and positive effect on the MFBs social performance (outreach). This implies unit increase in liquidity have positive effect on social performance of MFBs. Based on the findings, the study adopts the null hypothesis that liquidity regulations insignificantly affect Kenyan MFBs financial performance and adopts the alternative hypothesis that liquidity regulations significantly affect Kenyan MFBs social performance. From an empirical perspective, Mutarindwa, Schäfer and Stephan (2020) support that banks observing various liquidity thresholds lends smaller amounts compared with their peers while banks observing capital thresholds lend more than less capitalized banking entities. Adusei (2021) however documented a negative and statistically significant relationship between liquidity requirement and MFIs performance while Wanjiru (2016) documented that liquidity negatively affected ROA.

5.2.3 Loan Loss Provisioning and Performance

Under this objective, the study findings documented that loan loss provisioning had a negative and significant effect on the MFBs financial performance but an insignificant negative effect on the MFBs social performance. This implies that loan loss provisioning has a statistically significant effect on MFBs financial performance implying that a decrease in loan loss provisioning enhance the financial performance of MFBs. On this, various findings have been documented on varying results on the interrelationship between LLP and bank performance. For instance, Alhadab and Alsahawneh (2016) found that the bank's profitability was negatively affected by increase in loan loss provisions. However, Zulfikar and Sri (2019) documented that loan loss provisions had a positive effect on financial performance. Ahmad, Tahir and Aziz (2014) revealed that loan loss provision was a significant factor that affected banks profitability.

On the other hand, LLP does not have a statistically significant effect on the MFBs social performance (outreach). From the findings, the study adopts the null hypothesis that LLP insignificantly affects Kenyan MFBs outreach and adopt the alternative hypothesis that LLP significantly affects Kenyan MFBs financial performance (ROA). A study by Mustafa, Ansari and Younis (2012) documented that a lower loan loss provision translated into higher profitability. M'Mukiri (2013) found that loan provisioning had a negative influence on MFIs financial sustainability while Kombo (2014) documented that LLP provisioning is important in banks because it leads to financial stability in the Kenyan economy, improves credit risk management, as poor credit risk management requires more capital and leads to reduced vulnerability to liquidity shocks.

5.2.4 Bank Size and Performance

The findings documented that bank size had a positive and insignificant effect on the MFBs financial performance but a negative and significant effect on the MFBs social performance (outreach). This implies there is statistically significant relationship between bank size and MFBs financial performance. A statistically significant relationship exists between bank size and MFBs social performance indicating that a decrease in MFB size in terms of its assets

adversely affect the MFBs social performance. The findings therefore support that bank size significantly affects outreach but insignificantly affects ROA. From a theoretical perspective, the signaling theory supports that the greater the firm's size will give a positive signal that the company's financial performance is getting better while the modern financial intermediation theory suggests that there are efficiency gains related to size due to economies of scale which indicate the reduction in production costs. Empirically, Meiryani et al. (2020) supports that the greater the size of the company can give a good signal to the public. Kagecha (2016) however documented that size does not matter in determining bank profitability and suggested that although scale economies are important for profitability; local markets in Kenya do not always allow such scale economies to translate to higher profitability.

5.2.5 Bank Age and Performance

The study findings indicated that bank age positively but insignificantly affected the MFBs financial performance and that bank age had a positive and insignificant effect on the MFBs social performance. This implies that bank ages do not have a statistically significant relationship on the MFBs social and financial performance. Based on this finding, the study thus adopts the null hypothesis that bank age insignificantly affects Kenyan MFBs performance. From a theoretical perspective, the learning by doing theory posits that increasing knowledge of effective production techniques improves the performance of the organization. However, the structural inertia theory indicates that as organizations grow, it suffers bureaucratic bottlenecks and inflexibility, which may metamorphose into the problem of resistance to change. Empirically, Alshehri (2016) documented an insignificant effect of bank age on financial performance and suggested that Islamic Bank management to consider seriously the effect of bank size in terms of total assets on financial performance and not the bank age.

5.3 Conclusions

This study advances the existing microfinance literature on regulation by its analysis of the impact of prudential regulation on the social and financial performance of microfinance banks in Kenya. The regulation of financial institutions is very important in promoting

development, enhancing competition and protecting the interest of consumers (Arun & Murinde, 2010). As documented by other scholars, regulation can either promote or hinder development hence the need for a critical examination to assess the likely consequences proposed regulations and the actual consequences of existing regulations (Vogel &Schulz, 2012, Rodriguez-Lopez, 2015).

The study findings showed that capital regulations had an insignificant effect on MFBs financial and social performance, which implies that capital regulations have influence on MFBs social, and financial performance indicators of outreach and ROA. This study therefore concludes that capital regulatory requirements does not play any significant role towards Kenyan MFBs performance. This can be attributed to the fact that Kenyan MFBs are small in size and thus high capital requirements restrict their ability to grow and reach more clients. In addition, although a higher capital base enhances bank stability and cushions banking entities from potential loses, high capital requirement cuts banks' lending which might be the reason why capital regulation does not play a significant role among Kenyan MFBs as majority of them are highly capitalized.

Further, it was found that liquidity does not significantly affect the MFBs financial performance but had a significant impact on social performance meaning that an increase in liquidity enhanced outreach by the Kenyan MFBs. This study therefore concludes that liquidity significantly enhances MFBs social performance but does not play any significant role towards MFBs financial performance. Although, liquidity is essential for any financial entity to meet its current obligations, when they arise, most Kenyan MFBs are highly liquid hence they are able to meet loan demands from their clients however the high liquidity affects their ability to generate profitability.

In addition, the findings indicated that LLP insignificantly affected Kenyan MFBs social performance but significantly and negatively affected the MFBs financial performance meaning that a reduction in provision for impaired loans reduced the provisioning expense, which significantly enhance financial performance. This study therefore concludes that a reduction in the LLP expense significantly increases financial performance of MFBs in Kenya.

Size had an insignificant effect on financial performance but a significant and negative effect on social performance, which implies that smaller sized banks had a lower social performance. That is lower ability to reach additional clients. In addition, most of the Kenyan MFBs are small, which makes them unable to enjoy the benefits accruing from economies of scale thereby limiting their ability to improve their performance. The study therefore concludes that size of an MFB affects its outreach capacity since a smaller MFB may not have the ability to diversify geographically and reach a wider clientele.

Finally, firm age did not have significant effect on both financial and social performance of the MFBs, which can be attributed to the fact that majority of the MFBs are young and their major focus is growth in terms of revenue and assets as opposed to the bottom line (profitability) and outreach. The finding also implies that majority of the MFBs reinvest their earnings toward growth. The study based on this observation concludes that bank age did not play any significant role towards Kenyan MFBs performance.

5.4 Recommendations

5.4.1 Recommendations for Practice

In the final analysis, the results show that regulation influences both financial and social performance of MFBs in Kenya. Regulation begets increased public confidence and transparency. Hence, there is need for MFBs to comply with regulatory requirements so as to enhance investors' confidence and minimize odds of bank panic and runs.

Secondly, the MFBs management should ensure that they hold optimal liquidity levels as high liquidity levels reduce profitability while lower liquidity levels would affect their ability to meet current obligation as and when they fall due. Additionally, the study recommends that the MFBs management should ensure that they institute appropriate loan appraisal techniques to ensure they advance loans to trustworthy and able clients to reduce the amount of LLP as this would reduce the provisioning expense thereby enhancing financial performance.

From the study findings, it was evident that majority of the Kenyan MFBs were small in terms of assets and were young. This means the MFBs focus is growth both in size and terms

of revenue as opposed to the bottom line and outreach. The study therefore recommends that the Kenyan MFBs management should also concentrate on reaching more clients and diversifying their operations to attract more clients in combination with the growth objectives as this would enhance their performance.

5.4.2 Recommendation for Policy

In Kenya, MFBs are licensed and regulated by the Central Bank of Kenya (CBK), which also develops and institutes various prudential guidelines to guide the financial entities. Unfortunately, CBK uses similar guidelines to regulate both commercial and microfinance banks. However, commercial banks are larger in size and have been in operation for a longer period of time and they command the highest market share compared to MFBs. Most MFBs are small in size, with few assets and client base hence subjecting them to the same capital and liquidity requirements may be a hindrance to their growth. This study therefore recommends that the central bank should review, develop a regulatory framework for MFBs that takes into account the unique characteristics of MFBs.

5.5 Limitations of the Study

This study's context was microfinance banks in Kenya hence the findings are limited to the industry context as well as the Kenyan context. The results, findings and interpretation therefore may not be generalized to other financial entities both in Kenya and in other countries due to different regulatory structures and requirements. In Kenya, commercial banks and MFBs adhere to same prudential guidelines as issued by the CBK. However, the findings may not be generalized to commercial banks whose size, age and growth is different to those of most MFBs. While the first MFB was licensed in 2009, most commercial banks have existed for years hence the impact of prudential regulation is different from those of MFBs.

This study focused on capital regulations (proxied by the capital adequacy ratio), liquidity (measured through the liquidity ratio), LLP (proxied by the LLP ratio), bank size (measured through assets) and bank age (proxied by number of operating years). The study is therefore limited to the used measures as different measures may lead to different results. This study

also used secondary data which was gathered from the MFBs accounting reports. Secondary data however is historic in nature and fails to incorporate the qualitative views of managers and policy makers. Further, the study employed the regression model, which is based on several restrictive assumptions such as normality, no autocorrelation, and homoscedasticity among others. These limitations however do not dilute the study findings as every other study has its own inherent limitations.

5.6 Recommendations for Further Research

This study aimed at examining the relationship between prudential regulations and MFBs social and financial performance. This was achieved through collecting secondary data that was analysed using the regression model. However, the regression model as well as secondary data have their inherent limitations. This study therefore recommends a comparative study between prudential regulations and performance of MFBs and commercial banks. Such a study would help to determine whether same regulatory requirements are appropriate for MFBs and commercial banks. A similar study could also be undertaken using less restrictive models like Chi square, ANOVA, and comparison of means among others to determine the interrelationships.

Further, since this study did not incorporate the view of managers, policy makers and other stakeholders, a similar study could be undertaken using primary data collection tools like interviews and questionnaires to obtain their views and opinions. There also other measures of capital regulations, liquidity requirements, loan loss provisioning, financial performance as well as social performance. A similar study can be undertaken using those other measures for robustness check and to document whether the finding would be different.

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APPENDICES

Appendix I: Directory of Licensed Microfinance Banks in Kenya

Caritas Microfinance Bank Limited
Century Deposit Taking Microfinance Limited
Choice Microfinance Bank Limited
Daraja Microfinance Bank Limited
Faulu Kenya DTM
Kenya Women Finance Trust DTM
Key DTM (formerly Remu DTM Limited)
Maisha Microfinance Bank Limited
Rafiki Deposit Taking Microfinance (K) Limited
. SMEP DTM
. SUMAC DTM Limited
. U&I Deposit Taking Microfinance Limited
. Uwezo DTM

Source: Central Bank of Kenya (2021)

Appendix II: Data Collection Sheet

Microfinance name _____

Year	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Net income							
Total assets							
Total number of active borrowers							
Financial expenses							
Operating expenses							
Loan loss provision (LLP)							
Capital adequacy ratio							
Liquidity ratio							
Number of years since incorporation							

VT OMNES VNVM SINT

Appendix III: Overall Results and Findings

Model 1

Normality Test

```
. swilk residuals

                    Shapiro-Wilk W test for normal data

    Variable |   Obs        W           V          z       Prob>z
-------------+--------------------------------------------------
   residuals |    86     0.98215       1.301      0.578     0.28150
```

Homoscedasticity Test

```
. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of ROA

         chi2(1)      =     4.49
         Prob > chi2  =   0.0341
```

Multicollinearity Test

```
. estat vif

    Variable |       VIF       1/VIF
-------------+----------------------
    Bank_age |      2.86    0.349156
   Bank_size |      2.59    0.385983
Capital_ad~y |      1.76    0.567833
   Liquidity |      1.53    0.654300
         LLP |      1.45    0.687712
-------------+----------------------
    Mean VIF |      2.04
```

Autocorrelation Test

```
. xtserial ROA Capital_adequacy Liquidity LLP Bank_size Bank_age

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,      12) =      1.037
           Prob > F =      0.3287
```

Stationarity Tests

```
Fisher-type unit-root test for ROA
Based on augmented Dickey-Fuller tests
---------------------------------------
Ho: All panels contain unit roots          Number of panels       =     13
Ha: At least one panel is stationary       Avg. number of periods =   6.62

AR parameter: Panel-specific               Asymptotics: T -> Infinity
Panel means:  Included
Time trend:   Not included
Drift term:   Not included                 ADF regressions: 0 lags
------------------------------------------------------------------------
                                  Statistic      p-value
------------------------------------------------------------------------
 Inverse chi-squared(26)    P        77.6978       0.0000
 Inverse normal             Z        -3.3922       0.0003
 Inverse logit t(69)        L*       -4.7521       0.0000
 Modified inv. chi-squared  Pm        7.1692       0.0000
------------------------------------------------------------------------
 P statistic requires number of panels to be finite.
 Other statistics are suitable for finite or infinite number of panels.
------------------------------------------------------------------------
```

```
. xtunitroot fisher Outreach, dfuller lags(0)

Fisher-type unit-root test for Outreach
Based on augmented Dickey-Fuller tests
-------------------------------------------
Ho: All panels contain unit roots          Number of panels       =     13
Ha: At least one panel is stationary       Avg. number of periods =   6.62

AR parameter: Panel-specific               Asymptotics: T -> Infinity
Panel means:  Included
Time trend:   Not included
Drift term:   Not included                 ADF regressions: 0 lags
-------------------------------------------------------------------------
                                  Statistic      p-value
-------------------------------------------------------------------------
 Inverse chi-squared(26)    P        57.4806       0.0004
 Inverse normal             Z        -1.5965       0.0552
 Inverse logit t(69)        L*       -2.3041       0.0121
 Modified inv. chi-squared  Pm        4.3656       0.0000
-------------------------------------------------------------------------
 P statistic requires number of panels to be finite.
 Other statistics are suitable for finite or infinite number of panels.
-------------------------------------------------------------------------
```

```
. xtunitroot fisher Capital_adequacy, dfuller lags(0)

Fisher-type unit-root test for Capital_adequacy
Based on augmented Dickey-Fuller tests
-------------------------------------------
Ho: All panels contain unit roots          Number of panels       =     13
Ha: At least one panel is stationary       Avg. number of periods =   6.62

AR parameter: Panel-specific               Asymptotics: T -> Infinity
Panel means:  Included
Time trend:   Not included
Drift term:   Not included                 ADF regressions: 0 lags
-------------------------------------------------------------------------
                                  Statistic      p-value
-------------------------------------------------------------------------
 Inverse chi-squared(26)    P       104.9904       0.0000
 Inverse normal             Z        -2.3100       0.0104
 Inverse logit t(69)        L*       -5.7337       0.0000
 Modified inv. chi-squared  Pm       10.9540       0.0000
-------------------------------------------------------------------------
 P statistic requires number of panels to be finite.
 Other statistics are suitable for finite or infinite number of panels.
-------------------------------------------------------------------------
```

```
. xtunitroot fisher Liquidity, dfuller lags(0)

Fisher-type unit-root test for Liquidity
Based on augmented Dickey-Fuller tests
------------------------------------------
Ho: All panels contain unit roots           Number of panels       =     13
Ha: At least one panel is stationary        Avg. number of periods =   6.62

AR parameter: Panel-specific                Asymptotics: T -> Infinity
Panel means:  Included
Time trend:   Not included
Drift term:   Not included                  ADF regressions: 0 lags
------------------------------------------------------------------------
                                  Statistic      p-value
------------------------------------------------------------------------
 Inverse chi-squared(26)    P       191.6265       0.0000
 Inverse normal             Z        -8.0909       0.0000
 Inverse logit t(69)        L*      -14.2133       0.0000
 Modified inv. chi-squared  Pm       22.9683       0.0000
------------------------------------------------------------------------
 P statistic requires number of panels to be finite.
 Other statistics are suitable for finite or infinite number of panels.
------------------------------------------------------------------------
```

```
. xtunitroot fisher Bank_size, dfuller lags(0)

Fisher-type unit-root test for Bank_size
Based on augmented Dickey-Fuller tests
------------------------------------------
Ho: All panels contain unit roots           Number of panels       =     13
Ha: At least one panel is stationary        Avg. number of periods =   6.62

AR parameter: Panel-specific                Asymptotics: T -> Infinity
Panel means:  Included
Time trend:   Not included
Drift term:   Not included                  ADF regressions: 0 lags
------------------------------------------------------------------------
                                  Statistic      p-value
------------------------------------------------------------------------
 Inverse chi-squared(26)    P        83.5325       0.0000
 Inverse normal             Z        -2.7523       0.0030
 Inverse logit t(69)        L*       -4.4269       0.0000
 Modified inv. chi-squared  Pm        7.9783       0.0000
------------------------------------------------------------------------
 P statistic requires number of panels to be finite.
 Other statistics are suitable for finite or infinite number of panels.
------------------------------------------------------------------------
```

```
. xtunitroot fisher D.LLP, dfuller lags(0)
(13 missing values generated)

Fisher-type unit-root test for D.LLP
Based on augmented Dickey-Fuller tests
------------------------------------------------------------------------------
Ho: All panels contain unit roots           Number of panels       =     13
Ha: At least one panel is stationary        Avg. number of periods =   5.62

AR parameter: Panel-specific                Asymptotics: T -> Infinity
Panel means:  Included
Time trend:   Not included
Drift term:   Not included                  ADF regressions: 0 lags
------------------------------------------------------------------------------
                                     Statistic      p-value
------------------------------------------------------------------------------
 Inverse chi-squared(26)    P         94.1830       0.0000
 Inverse normal             Z         -2.8985       0.0019
 Inverse logit t(69)        L*        -4.9121       0.0000
 Modified inv. chi-squared  Pm         9.4553       0.0000
------------------------------------------------------------------------------
 P statistic requires number of panels to be finite.
 Other statistics are suitable for finite or infinite number of panels.
------------------------------------------------------------------------------
```

```
. xtunitroot fisher Bank_age, dfuller lags(0)

Fisher-type unit-root test for Bank_age
Based on augmented Dickey-Fuller tests
------------------------------------------------
Ho: All panels contain unit roots          Number of panels       =     13
Ha: At least one panel is stationary       Avg. number of periods =   6.62

AR parameter: Panel-specific               Asymptotics: T -> Infinity
Panel means:  Included
Time trend:   Not included
Drift term:   Not included                 ADF regressions: 0 lags
------------------------------------------------------------------------
                                  Statistic      p-value
------------------------------------------------------------------------
 Inverse chi-squared(26)    P       937.1350       0.0000
 Inverse normal             Z       -29.2983       0.0000
 Inverse logit t(69)        L*      -72.1819       0.0000
 Modified inv. chi-squared  Pm      126.3517       0.0000
------------------------------------------------------------------------
 P statistic requires number of panels to be finite.
 Other statistics are suitable for finite or infinite number of panels.
------------------------------------------------------------------------
```

Model 2: Results

Normality Test

```
. swilk residuals

                    Shapiro-Wilk W test for normal data

    Variable |   Obs        W           V         z       Prob>z
-------------+--------------------------------------------------
   residuals |    86     0.98810       0.867    -0.315    0.62361
```

Homoscedasticity Test

```
. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of Outreach

         chi2(1)       =     0.02
         Prob > chi2   =   0.9019
```

Multicollinearity Test

```
. estat vif

    Variable |       VIF       1/VIF
-------------+----------------------
    Bank_age |      2.86    0.349156
   Bank_size |      2.59    0.385983
Capital_ad~y |      1.76    0.567833
   Liquidity |      1.53    0.654300
         LLP |      1.45    0.687712
-------------+----------------------
    Mean VIF |      2.04
```

Autocorrelation Test

```
. xtserial Outreach Capital_adequacy Liquidity LLP Bank_size Bank_age

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,      12) =      0.163
           Prob > F =      0.6933
```

Correlation Analysis

```
. pwcorr ROA Outreach Capital_adequacy Liquidity LLP Bank_size Bank_age, sig star(5)

             |      ROA Outreach Capita~y Liquid~y      LLP Bank_s~e Bank_age
-------------+---------------------------------------------------------------
         ROA |   1.0000
             |
             |
     Outreach |   0.3996*  1.0000
             |   0.0001
             |
Capital_ad~y |   0.3146*  0.0124   1.0000
             |   0.0032   0.9095
             |
   Liquidity |   0.0873  -0.1585   0.5335*  1.0000
             |   0.4243   0.1450   0.0000
             |
         LLP |  -0.2493* -0.1314  -0.2654*  0.0468   1.0000
             |   0.0206   0.2280   0.0135   0.6688
             |
   Bank_size |   0.4192*  0.7925* -0.0648  -0.2068  -0.1708   1.0000
             |   0.0001   0.0000   0.5533   0.0560   0.1159
             |
    Bank_age |   0.2122*  0.4165* -0.3487* -0.2105   0.2621*  0.6777*  1.0000
             |   0.0499   0.0001   0.0010   0.0517   0.0148   0.0000
```

Hausman Test Results (Model 1)

```
. hausman fixed .

                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |     fixed       random       Difference          S.E.
-------------+------------------------------------------------------------
Capital_ad~y |    .0155741     .0260438      -.0104696        .0073024
   Liquidity |    -.021796    -.0156589      -.0061371        .0099765
         LLP |   -.4777426    -.4588926        -.01885        .0322995
   Bank_size |     .014963     .0218966      -.0069336        .0164263
    Bank_age |    .0044352     .0049718      -.0005367        .0016216
------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =        3.48
                Prob>chi2 =      0.6266
```

Regression Results (Model 1a)

```
. xtreg ROA Capital_adequacy Bank_size Bank_age, re vce(robust)

Random-effects GLS regression                   Number of obs      =        86
Group variable: Firmid                          Number of groups   =        13

R-sq:  within  = 0.0284                         Obs per group: min =         5
       between = 0.2671                                        avg =       6.6
       overall = 0.1927                                        max =         7

                                                Wald chi2(3)       =      6.29
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0984

                                  (Std. Err. adjusted for 13 clusters in Firmid)
------------------------------------------------------------------------------
             |               Robust
         ROA |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
Capital_ad~y |   .0187621   .0295893     0.63   0.526    -.0392319    .0767561
   Bank_size |  -.0066019   .0072285    -0.91   0.361    -.0207695    .0075658
    Bank_age |   .0299329   .0267859     1.12   0.264    -.0225665    .0824322
       _cons |  -.1892012   .0966945    -1.96   0.050     -.378719    .0003166
-------------+----------------------------------------------------------------
     sigma_u |  .13092805
     sigma_e |  .08724396
         rho |  .69250982   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Regression Results (Model 1b)

```
. xtreg ROA Liquidity Bank_size Bank_age, re vce(robust)

Random-effects GLS regression                   Number of obs      =        86
Group variable: Firmid                          Number of groups   =        13

R-sq:  within  = 0.0249                         Obs per group: min =         5
       between = 0.2723                                        avg =       6.6
       overall = 0.1926                                        max =         7

                                                Wald chi2(3)       =      3.30
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.3483

                                 (Std. Err. adjusted for 13 clusters in Firmid)
------------------------------------------------------------------------------
             |               Robust
         ROA |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  Liquidity  |   .0104263   .0209907     0.50   0.619    -.0307147    .0515674
  Bank_size  |  -.0070019   .0068804    -1.02   0.309    -.0204872    .0064835
   Bank_age  |   .0351498   .0224695     1.56   0.118    -.0088896    .0791891
       _cons |  -.2022832   .0915836    -2.21   0.027    -.3817838   -.0227827
-------------+----------------------------------------------------------------
     sigma_u |  .12056273
     sigma_e |  .08735252
         rho |  .65575568   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Regression Results (Model 1c)

```
. xtreg ROA LLP Bank_size Bank_age, re vce(robust)

Random-effects GLS regression                   Number of obs      =        86
Group variable: Firmid                          Number of groups   =        13

R-sq:  within  = 0.1290                         Obs per group: min =         5
       between = 0.2422                                        avg =       6.6
       overall = 0.2051                                        max =         7

                                                Wald chi2(3)       =     20.41
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0001

                                 (Std. Err. adjusted for 13 clusters in Firmid)
------------------------------------------------------------------------------
             |               Robust
         ROA |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         LLP |  -.4769163   .2238278    -2.13   0.033    -.9156108   -.0382218
   Bank_size |   .0024842   .0094247     0.26   0.792    -.0159878    .0209562
    Bank_age |   .0239566    .020433     1.17   0.241    -.0160913    .0640045
       _cons |   -.171028   .0863522    -1.98   0.048    -.3402752   -.0017807
-------------+----------------------------------------------------------------
     sigma_u |  .13215033
     sigma_e |  .08256718
         rho |   .7192321   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Regression Results (Model 1d)

```
. xtreg ROA Capital_adequacy Liquidity LLP Bank_size Bank_age, re vce(robust)

Random-effects GLS regression                   Number of obs      =        86
Group variable: Firmid                          Number of groups   =        13

R-sq:  within  = 0.1365                         Obs per group: min =         5
       between = 0.2560                                        avg =       6.6
       overall = 0.2169                                        max =         7

                                                Wald chi2(5)       =     30.88
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000

                                 (Std. Err. adjusted for 13 clusters in Firmid)
------------------------------------------------------------------------------
             |               Robust
         ROA |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
Capital_adeq~y |   .0242515   .0252277     0.96   0.336    -.0251939    .0736969
   Liquidity |  -.0051155   .0278228    -0.18   0.854    -.0596471    .0494162
         LLP |  -.4885722   .2230486    -2.19   0.028    -.9257395   -.0514049
   Bank_size |   .0033365   .0089598     0.37   0.710    -.0142243    .0208973
    Bank_age |   .0182004   .0205036     0.89   0.375    -.0219859    .0583867
       _cons |  -.1614267    .077899    -2.07   0.038     -.314106   -.0087474
-------------+----------------------------------------------------------------
     sigma_u |  .13086785
     sigma_e |  .08341002
         rho |  .71112191   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Hausman Results (Model 2)

```
. hausman fixed .

                 ---- Coefficients ----
                 (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
                 fixed        random         Difference          S.E.
-------------------------------------------------------------------------
Capital_ad~y     .0357678     .0040624       .0317054        .096114
   Liquidity     .6189383     .7300281      -.1110898       .0748229
         LLP    -.6189534    -.6561955       .0372421       .1819467
   Bank_size    -.1007562     -.093538      -.0072182       .0032087
    Bank_age     .1434808     .0919618        .051519       .0713553
-------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =       18.45
                Prob>chi2 =      0.0024
```

Regression Results (Model 2a)

```
. xtreg Outreach Capital_adequacy Bank_size Bank_age, fe

Fixed-effects (within) regression               Number of obs      =        86
Group variable: Firmid                          Number of groups   =        13

R-sq:  within  = 0.3127                         Obs per group: min =         5
       between = 0.0000                                        avg =       6.6
       overall = 0.0955                                        max =         7

                                                F(3,70)            =     10.62
corr(u_i, Xb)  = -0.3788                        Prob > F           =    0.0000

------------------------------------------------------------------------------
     Outreach |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
--------------+---------------------------------------------------------------
Capital_adequacy |    .097887   .1402743     0.70   0.488    -.1818814    .3776553
   Bank_size |   -.1267623   .0232312    -5.46   0.000    -.1730954   -.0804292
    Bank_age |    .1557765    .097962     1.59   0.116    -.0396026    .3511556
       _cons |    .2513214   .3344919     0.75   0.455    -.4158018    .9184445
-------------+----------------------------------------------------------------
     sigma_u |   .39417579
     sigma_e |   .37072082
         rho |   .53063542   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(12, 70) =     7.64                 Prob > F = 0.0000
```

Regression Results (Model 2b)

```
. xtreg Outreach Liquidity Bank_size Bank_age, fe

Fixed-effects (within) regression               Number of obs      =        86
Group variable: Firmid                          Number of groups   =        13

R-sq:  within  = 0.4282                         Obs per group: min =         5
       between = 0.2866                                        avg =       6.6
       overall = 0.3658                                        max =         7

                                                F(3,70)            =     17.47
corr(u_i, Xb)  = 0.0241                         Prob > F           =     0.0000

------------------------------------------------------------------------------
    Outreach |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   Liquidity |   .6399207   .1667993     3.84   0.000     .3072499    .9725914
   Bank_size |   -.113144   .0214765    -5.27   0.000    -.1559775   -.0703105
    Bank_age |   .1539695   .0893552     1.72   0.089    -.0242439    .3321829
       _cons |  -.0028932   .3089355    -0.01   0.993    -.6190456    .6132593
-------------+----------------------------------------------------------------
     sigma_u |   .2837839
     sigma_e |   .3381522
         rho |  .41324515   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(12, 70) =     5.89                 Prob > F = 0.0000
```

Regression Results (Model 2c)

```
. xtreg Outreach LLP Bank_size Bank_age, fe

Fixed-effects (within) regression               Number of obs      =        86
Group variable: Firmid                          Number of groups   =        13

R-sq:  within  = 0.3202                         Obs per group: min =         5
       between = 0.0006                                        avg =       6.6
       overall = 0.1374                                        max =         7

                                                F(3,70)            =     10.99
corr(u_i, Xb)  = -0.2048                        Prob > F           =    0.0000

------------------------------------------------------------------------------
    Outreach |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         LLP |   -.8399498   .7456419    -1.13   0.264    -2.327086    .6471861
   Bank_size |    -.111245   .0274481    -4.05   0.000    -.1659884   -.0565015
    Bank_age |    .1409068   .0982667     1.43   0.156      -.05508    .3368937
       _cons |    .3275628   .3267539     1.00   0.320    -.3241273    .9792529
-------------+----------------------------------------------------------------
     sigma_u |   .36189008
     sigma_e |   .36868136
         rho |   .49070497   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(12, 70) =     6.85                 Prob > F = 0.0000
```

Regression Results (Model 2d)

```
. xtreg Outreach Capital_adequacy Liquidity LLP Bank_size Bank_age, fe

Fixed-effects (within) regression               Number of obs      =        86
Group variable: Firmid                          Number of groups   =        13

R-sq:  within  = 0.4350                         Obs per group: min =         5
       between = 0.2132                                        avg =       6.6
       overall = 0.3386                                        max =         7

                                                F(5,68)            =     10.47
corr(u_i, Xb)  = -0.0555                        Prob > F           =    0.0000

------------------------------------------------------------------------------
    Outreach |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
Capital_adeq~y |   .0357678   .1310515     0.27   0.786    -.2257415     .297277
   Liquidity |   .6189383    .171082     3.62   0.001     .2775495    .9603272
         LLP |   -.6189534   .6956081    -0.89   0.377    -2.007018    .7691109
   Bank_size |   -.1007562   .0256392    -3.93   0.000    -.1519185   -.0495939
    Bank_age |   .1434808   .0908978     1.58   0.119    -.0379028    .3248645
       _cons |   .0110133   .3168417     0.03   0.972    -.6212344    .6432611
-------------+----------------------------------------------------------------
     sigma_u |   .29759575
     sigma_e |   .34101733
         rho |   .43231932   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(12, 68) =     4.37                 Prob > F = 0.0000
```

Appendix IV: Research Facilitation Letter

Ole Sangale Rd, Madaraka Estate,
P.O Box 59857 00200, Nairobi, Kenya.
Cell: +254 703 034 606/7, Twitter: @StrathKenya
Email: info@sbs.ac.ke or visit www.sbs.strathmore.edu

Strathmore UNIVERSITY
BUSINESS SCHOOL

Thursday, 05 November 2020

RE: FACILITATION OF RESEARCH MADIALO LAWRENCE ODERO MDF |102974|17

This is to introduce Madialo Lawrence Odero who is a Master of Science in Development Finance student at Strathmore University Business School, admission number MDF 102974/17. As part of our MDF Program, Lawrence is expected to do applied research and undertake a project. This is in partial fulfilment of the requirements of the MDF course. To this effect, he would like to request for appropriate data from your organization.

Lawrence is undertaking a research paper on "**AN EVALUATION OF THE EFFECT OF PRUDENTIAL REGULATIONS ON PERFORMANCE OF MICROFINANCE INSTITUTIONS IN KENYA.**" The information obtained from your organization shall be treated confidentially and shall be used for academic purposes only.

Our MDF seeks to establish links with industry, and one of these ways is by directing our research to areas that would be of direct use to industry. We would be glad to share our findings with you after the research, and we trust that you will find them of great interest and of practical value to your organization.

We appreciate your support and shall be willing to provide any further information if required.

Yours sincerely,

Veronica Muniu,
Manager| Graduate Programmes, Strathmore University Business School

Appendix V: Research Approval Letter

Strathmore UNIVERSITY

15th September 2021

Mr Madialo Lawrence,
lmadialo@gmail.com

Dear Mr Madialo,

RE: An Evaluation of The Effect of Prudential Regulations on Performance of Microfinance Banks in Kenya

This is to inform you that SU-IERC has reviewed and **approved** your above **SU-master's** research proposal. Your application reference number is **SU-IERC956/20.** The approval period is **15th September 2021 to 14th September 2022.**

This approval is subject to compliance with the following requirements:

i. Only approved documents including (informed consents, study instruments, MTA) will be used
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by SU-IERC.
iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to SU-IERC within 48 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to SU-IERC within 48 hours
v. Clearance for export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days upon completion of the study to SU-IERC.

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology, and Innovation (NACOSTI) https://researchportal.nacosti.go.ke/ and also obtain other clearances needed.

Yours sincerely,

for: Dr Virginia Gichuru,
Secretary; SU-IERC

Cc: Prof Fred Were, **Chairperson; SU-IERC**

Ole Sangale Rd, Madaraka Estate. PO Box 59857-00200, Nairobi, Kenya. Tel +254 (0)703 034000
Email admissions@strathmore.edu www.strathmore.edu

Appendix VI: NACOSTI Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **796121**

Date of Issue: **07/September/2021**

RESEARCH LICENSE

This is to Certify that Mr.. Lawrence Odero Madialo of Strathmore University, has been licensed to conduct research in Nairobi on the topic: AN EVALUATION OF THE EFFECT OF PRUDENTIAL REGULATIONS ON THE SOCIAL AND FINANCIAL PERFORMANCE OF MICROFINANCE BANKS IN KENYA for the period ending : 07/September/2022.

License No: **NACOSTI/P/21/12688**

796121

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

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P. O. Box 30623, 00100 Nairobi, KENYA
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Mobile: 0713 788 787 / 0735 404 245
E-mail: dg@nacosti.go.ke / registry@nacosti.go.ke Website: www.nacosti.go.ke

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